

MOTOR AGE

CHICAGO, NOVEMBER 7, 1907

GARDEN SHOW IN BRIEF

THOUSANDS of people were in attendance at the opening of the eighth annual show of the Association of Licensed Automobile Manufacturers in Madison Square garden last Saturday night, and this auspicious start is taken as an indication that the exhibition will prove to be a success, financially and otherwise. The weather is anything but propitious, rain falling steadily all the evening.

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Tourabouts, the four-passenger cars, apparently are popular, being seen on every hand. The Stearns rig in this type is particularly catching. The Thomas town cab is the only one with four cylinders made in one casting. It has the carbureter in the crankcase and the transmission on the rear axle, besides showing other striking novelties in design.

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Sensations of the show include the \$850 four-cylinder Buick runabout with planetary gearset, shaft drive and a motor with valves in the head. The Oldsmobile puts forth a four-cylinder at \$1,900, while the Apperson clamors for attention in the medium-priced crowd with a four-cylinder at \$2,750. Many new cars by old makers are shown, among them being a Stevens four, a Haynes with a new motor, and a pair of Loziers. Others show many changes, with the exception of the Pierce, Packard, Stevens and Locomobile, which have not made any radical departures from 1907 design.

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Ten six-cylinder models are shown—the Pierce, Stevens, Peerless, Stearns, Apperson, Winton, Franklin, Lozier, Oldsmobile and Thomas, some of them having two models. Another feature is that three of those makers who heretofore have confined themselves to building only air-

coolers have ventured into the water-cooled game—the Corbin, Knox and Waltham. The Thomas and Walter are the only ones who are showing town cabs.

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One of the greatest surprises of the show is the strong front put up by the motor cycle makers, who have a splendid exhibit, fourteen of the manufacturers of the two-wheelers holding forth in the basement of the garden. Regret is heard on all sides that the management did not give this type more room and better quarters for display purposes.

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The commercial exhibit is a large one, including the wares of the Packard, Knox, Hewitt, Franklin, Pope, General Electric, Cadillac, Alden Sampson, Champion, Studebaker and Thomas. The exhibit of accessories is the largest ever held in the garden, although a great percentage of the exhibits was seen in the palace.

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Inside the garden there is a display that excels all preceding events held in the big building, the Italian garden effect of the decorations making a brilliant setting for the display of the cars of the Seldenites, or licensed makers.

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Double ignition systems and magnetos are popular, and almost every car has the former. The Simplex is the only one to do away with double ignition and depend solely upon a high tension magneto. Another feature is found in the Haynes, which has two flywheels, one at the front and the other at the rear. Its oiler and oil tank are carried in the front motor arms. The Stearns has its oiler in one motor arm and the water pump on the opposite arm, a practice that is being followed to some extent by other makers at home and in Europe.





NEW YORK, Nov. 3—With hopes heightened, optimism obtrusive and success seemingly assured, the Selenites raised the curtain on the selling season of 1908 at Madison Square garden last night amid an atmosphere of enthusiasm that a pelting rain storm outside failed utterly to befog. Never, so far as surface indications go, has any motor car show in New York's historic amusement amphitheater opened with more encouraging portent, more satisfactory environment and greater assurance of public patronage than the show inaugurated by the Association of Licensed Automobile Manufacturers last night. If there had been any fears that the present financial situation would work a diminution in the interest and attendance of New Yorkers in general and of the classes of people able to buy cars of the higher grades and prices, they were dispelled; for despite the driving storm there were hundreds awaiting the opening of the gates and for 2 hours following 8 o'clock an unbroken line of closed cars, taximeter cabs and horse-drawn carriages deposited their freight of enthusiasts at the door, while through the covered walk without plodded and slopped a dripping stream of mackintoshes and umbrellas-sheltered humanity. Within there must have been 5,000 people, who had braved the drenching rain for a first sight of the 1908 licensed cars, and that means a lot of people, enough to fill though not to jam the aisles, galleries, restaurant, concert hall and basement of the vast building.

When one had taken his initial view of the interior and made his first hasty round of the exhibition he did not wonder that

the licensed makers had regarded the rival preceding show so complacently and so confidently had awaited the opening of their own exhibition. The truth is that no building at present in existence in New York can hope to compete in show-giving conveniences and possibility of display with Madison Square garden otherwise than at a most conspicuous disadvantage.

Madison Square garden was at its best, its very best, in fact its best ever, last night in the matter of a beautiful setting for a display of motor cars. Going further, it may be said that for the first time in its series of annual motor shows, of which the present is the eighth, there has been evolved an absolutely satisfactory setting for the exhibits. The demand for pleasing, artistic and appropriate embellishment seems at last to have been answered by the promoters of the show.

In past shows the garden has either been disfigured by tawdry draperies or overdressed with theatrical scenery that utterly lost its effect on the necessary near-by inspection, as it did last year. This year, however, most of the theatrical clap-trap is missing or the art of the stage-setter has cleverly adapted itself to the necessary propinquity of inspection. In a word, more of realism has been obtained and the make-believe obtrudes itself with less illusion-dispelling frequency.

The scheme is, in brief, that of an Italian garden with a villa at one end high up on terraces—terraces rising on the sides, and beneath a garden with lighted pillars marking the central part. The entrance to Madison Square garden passed and the amphitheater gained, the visitor finds facing him the gateway of the entrance to this Italian garden. There are eight great iron gates swinging between high, massive, statue-topped posts. Within one sees a tiled pathway flanked on either side by box-bordered grass plats, with an evergreen tree in the center of each. Through an arch with statues on either side, there is the perspective of a path through the garden, though this is but a painted scene behind which are the cars themselves stretching to the Fourth avenue end.

Mounting one of the stairways to the place in the gallery over the Madison avenue entrance normally occupied by the royal box one best views the tout ensemble of the decorative scheme. At the far end on a back drop is painted in gigantic perspective the red-tiled Italian villa itself with its surrounding foliage and flower beds. Leading down from it is a series of terraces to the garden below, which is, of course, the main floor of the amphitheater. A single line of tall white posts surmounted by electric globes stretches down the entire length of the garden.

Viewing the galleries on either side, the idea of surrounding terraces is well carried out, the terraces rising in order first to the so-called platform, then by a couple of steps to another platform behind, and then above to the gallery. Platforms and gallery are protected in front by painted balustrades, broken at intervals by gold-topped white pillars and by statues bearing electric clusters. Above the roof is hidden by gray cloth hung between the electric arches instead of concealing them as last year, thus giving their brilliancy and natural decorative effect



VIEW INSIDE THE GARDEN SATURDAY MORNING

full play. There are also gray cloth hangings from the galleries to shut off any sight of their roofs. A line of electric lights also stretches along the gallery.

The signs on the posts marking the exhibits are most effective and artistic. Their lettering in gold is on a background of crimson, the sign being ornately framed in white scroll, those on the main floor being studded with electric lights.

The stands on the main floor are set in a center oval encircled by a single aisle with an outer circle of stands beneath the platform backed by crimson hangings. The whole color scheme is white, gray and crimson. On the platform the car exhibits are set to the front with an aisle behind, though the accessories stands behind and a step or two higher have their aisle in front. The floors of all the vehicle stands are laid with crimson carpets. There are no railings separating the stands. Looking toward the Madison avenue entrance the main floor garden is backed by a crimson curtain and high up in the gallery "Eighth National" blazes in big red electric letters. "A. L. A. M." is in great gold letters on the crimson hangings at the west end and on either side, lest you forget. There is a pandering to the practical and convenient on the main floor through the placing of telephone booths on the outer edge of the encircling aisle in the southeast corner, for which say all "Heaven be praised and the show committee be thanked."

In the restaurant at the right of the entrance hall, where the electric pleasure vehicles are displayed, the posts are draped and the floor covered with crimson with gray hangings above. Down in the dungeon deep, where are more accessory makers, commercial vehicles, the exiled Simplex and the better-place deserving motor cycles, all possible has been done with crimson and gray hangings and crimson and gold signs. The condemned, however, have the consolation of being near a German rathskeller with rustic posts, walls emblazoned with Teutonic booze mottos, fake foliage, red and green electric lights and real beer. This year the entire basement extending to Fourth avenue has been given over to exhibits. The makers of bodies, motors and other parts hold forth in the concert hall back of the west gallery. They, too, have a cafe close at hand.

So far as the grouping of gasoline pleasure cars on the main floor and platform, the electric pleasure vehicles in the restaurant and the business wagons in the basement goes the show is well segregated. There is, however, reform much needed at this and all shows in a most desirable segregation of the accessories and parts exhibits by aiding investigators through grouping, for instance, the tires, the lamps, the shock absorbers, the lubricating devices, the magnetos and other fittings of extensive use and wide numerical display.

The Motor Age staff has not yet completed its census. A rough first night count, however, places the total number of exhibitors at 294, of which thirty-one show pleasure cars, nine electric vehicles, twelve business wagons and fourteen motor cycles. It would appear that ten makes of six-cylinder cars are on view.



AS THE STREET LOOKED BEFORE THE SHOW OPENED

It is indeed a magnificent display of cars that the American makers of the licensed group have evolved for 1908. The absence this year of the imported cars is to be noted, but as a mere incident of the show's history; for in view of the perfected product of Uncle Sam's factories on view in Madison Square garden they are not missed. On the other hand, the importers have had a high standard set for the foreign cars to even equal at the coming show of the salon during New Year week.

A surprise for which most show-goers were utterly unprepared lies in the large number of new cars that have been brought out. In fact, there is not a booth at which something entirely new or radically improved is not to be seen.

To briefly summarize the hasty observations of a hurrying round of the booths last night is the best that can be done at this early writing, though all deserve much more than this mere passing notice even in a general review touching only the high spots in the garden.

The Buick has two new four-cylinder cars, one of which should make even Henry Ford sit up and take notice that the licensed group does not propose to lie down en masse without a struggle in the matter of low-price competition.

Apperson Brothers have bestirred themselves in the production of a little six and also a four-cylinder at a medium price. The Northern people have dropped their air-controlled car. The



GALLERY IN THE GARDEN, SHOWING SOME OF THE DISPLAYS OF TIRES



TAKING A LIMOUSINE IN THE BACK WAY

Electric Vehicle Co. has absolutely rebuilt its electric-gasoline car and the Haynes shows an entirely new motor with two flywheels and other improvements. Selden, who is responsible for the association, makes his first bow at a show with a car, new, of course; and Knox introduces a water-cooled model.

Lozier is out with new shaft-driven cars. The Elmores have been very much changed and are now confined to two-cylinder models for next season.

Alexander Winton, the veteran, has jumped to the six-cylinder and will courageously stick to it exclusively. The Peerless people also show a new six-cylinder. Stearns shows a six, a new four and a natty thing in the tourabout line with staggered front seats, left running board seat and miniature two-passenger tonneau. Pope proves himself very, very much alive with the Pope-Toledo showing a host of improvements and the Pope-Hartford even bettered by new selective gear, double ignition and oiling device systems. The Olds Motor Works have evolved a six and will make a hard fight when it comes to price competition with its four-cylinder touring car. Thomas has the biggest line in the show; but is most conspicuous in his display of tour cars, whose motors, by the way, are most ingenious. In addition to the big six and little six there is an entirely new four-cylinder Stevens-Duryea. Franklin has brought out a newly-designed motor with concentric valves. Pierce has added a little six to the Great Arrow line and shows a limousine whose finish and equipment are worth looking over. Walter has a new town cab and there have been transmission changes in the big Mathesons. The White for the first time has a straight-line body. Its steam plant also shows improvements. Both Corbin and Waltham are now displaying water-cooled models. The Packard has greatly improved its rear axle construction. The webs are now internal.



INTERIOR VIEW, SHOWING CASTLE IN BACKGROUND

The Locomobile people have raised the standard of their lower-priced car closer to that of their top-notchers. A stanhope seat has been added to the Cadillac runabout.

The exhibit of the electric vehicles is really wonderful, its variety, of course, lying in the various types of bodies that have been conceived and built. In the line of novelty the roadster form of construction is noteworthy.

The commercial vehicle display is 10 per cent larger than at any other previous show. Easily most conspicuous in it is the Alden Sampson train of trailers.

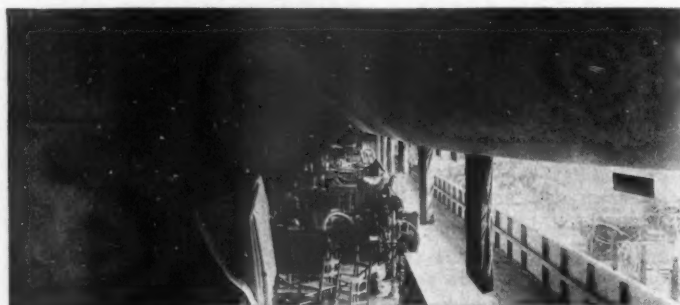
The first real motor cycle exhibit made in this country worthy of the name through its comprehensiveness is to be seen at the garden. Great improvement in construction is in evidence. It is a shame that the management relegated it to the basement.

At first glance there is little new to be seen in the accessories at the garden not previously on view at the palace, though there are ninety-six new accessories exhibitors in evidence.

The Franklin remains the sole exclusive exponent of the air-cooled motor in the licensed group, the Knox, Corbin and Orient people having added water-cooled cars to their lines.

The brunt of the licensed fight in the low-priced struggle will have to be borne by the Cadillac, Buick and Orient, with the assistance of Franklin, Northern and Elmore at slightly higher figures, unless one of the Oldsmobiles be entitled to admission to this class. In the medium-price class the Seldenites will be well equipped with a noteworthy group of cars ranging between \$2,000 and \$3,000, including Apperson, Olds, Thomas Detroit, Stevens-Duryea, Pope-Hartford and Haynes. The strongest price play in closed vehicles is being made by E. R. Thomas with his town cars and a limousine. It is to be noted that at several booths car exhibitors are demonstrating their power and transmission plants separately.

A. A. A. annual tour accomplishments are being used extensively by successful makers. The White people have on view the Hower runabout trophy won by H. K. Sheridan.



SCENE IN THE GARDEN GALLERY

The licensed people will stick closely to the garden during the week, having resolved to cut out all outside fireworks in the line of luncheons, banquets and such, for which the normally well-fed and abnormally overworked newspaper men are truly grateful. There will, however, be important A. A. A. meetings and conferences, but that is no fault of the A. L. A. M.

By way of a display of courage and optimism the A. L. A. M. makers are advertising as extensively as ever in the dailies, the amount yesterday running from thirty-two to forty-six columns in the papers that attempt to do motoring justice.

Woman at the garden show is more than an element of beauty and does much more than add charm to the affair. She buys cars. More potent is her commercial influence than at any previous show. She is a dominating feature in metropolitan motor car trade. If she does not make the actual purchase with her own check, she influences the mere man who thinks he makes up his mind for himself—not to mention the one who knows better than to think so.

In nearly every exhibit one may see groups of visitors among whom the women evidence as keen a desire for information as their male escorts. They ask all sorts of questions about cars—mechanical; near mechanical; about cost, and, pre-eminently,

about smooth-running qualities. They are ready and sure judges for themselves on the appearance of cars and their taste, as a whole, does not seem to be far away from the accepted standards of beauty in motor car design.

The kinds of cars in which women are interested vary as widely as the women. The more wealthy ones naturally incline toward luxurious town cars for their personal use. They are scrutinizing observers of the details of style and comfort in these vehicles. Their chief interest in the mechanical features is in demonstration of ease of handling and what they call "nice" running. Yet they are not, as a class, purchasers of extreme types or styles. They prefer the limousine or the landaulet which has the dignity and distinction that characterizes the class of horse-drawn carriages to which they have been used. Thus, for illustration, it was said at the Packard booth that nearly all of the women purchasers of limousines and landaulets ordered the standard Packard body, the quiet, standard finish, or similar dark rich finishes.

When the woman casts her eye at a touring car or a runabout, however, her notions of elegance change. She tries for the



ANOTHER VIEW OF THE GALLERY

swagger as well as the smart. The bright and the light colors catch her. Opening night at the show there was a swarm of women around the lavender, gold-striped, white-upholstered Packard roadster and, even as the fair sex stood by the Brewster green and black limousine discussing its features with salesmen, they cast longing glances at the lavender creation which some wag had named the honeymoon car.

Among those who must be content with the moderate-priced vehicles, tastes are more varied. There is a certain class of women which shows remarkably good sense in helping husbands select cars for general utility. There are, of course, others who have only appreciation of appearance. In only rare instances does the purchasing power in the fair sex seem to demand high speed. Surely they have whims, or they would not be women, and many a salesman at the show has struggled hard to analyze their mental processes. It is an interesting study, because the woman must be recognized, even though the other half of the sketch signs the check.

There is but one story in the body line, and that is the tour-about. As the rumble seat roadster was the magnet from a display point of view 2 years ago and last year, so the four-passenger surrey is the drawing card this year. All makers do not show the four-seated surrey, but some have a roadster with two rumble or bucket seats in the rear placed side by side, with the buyer given the privilege of taking one off when desired and slipping the other over to the center. Each maker in explaining the value of this car dilates on the weight reduction which works a most appreciable reduction in the rear tire wear and the upkeep of the car. One maker is sufficiently sanguine to claim a weight reduction of 250 pounds in his new surrey as compared with his five-passenger touring car mounted on the same chassis. This may be the case, but if an average were struck the weight reduction would be considerably less than 250 pounds. Among those who are considering the motor car business prospects for the high-priced product calmly, the weak-kneed ones are by no means in the majority. An exhibitor whose product is as high-priced as any in the show put it this way: "It is not the \$5,000 and \$6,000 car men who have to fear the future. We

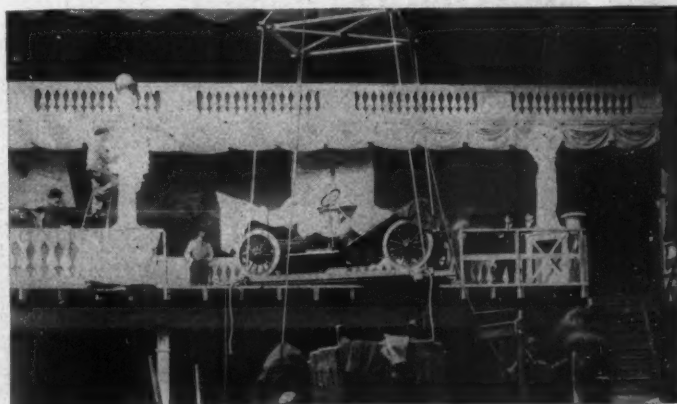


BIG GATE LEADING INTO THE SHOW

cater only to the very rich, to whom, unless they be entirely broke, these prices are mere bagatelles. For instance, a banker talked hard times to me and then switched to a talk about the kind of car he wanted to buy now. A big Los Angeles manufacturer prophesied that things at his factory would come to a standstill, and so he proposed to take back with him a car and go touring until business picked up again. I tell you it will be the men of moderate means, who cannot afford to pay over \$3,000 for a car, that will be the poor ones and have to deny themselves. To the rich, I repeat, the purchase of a car is a mere trifle, even if they have most of their money tied up in margins in Wall street."

It takes one back to the old bicycle show days to walk down the aisles. Colonel Pope, who used to sit in a big tonneau and swap stories with the old bicycle crowd, is missed this year from his accustomed seat through being ill at his Boston home. The gigantic A. G. Spalding exchanges greetings with George Pope and J. W. Kiser, of Monarch fame, who is a banker now, pump-handles old friends down the aisle. Lindsay Coleman has not yet showed up at the garden, though the famous old fighter has a quasi-standing in motordom through his batteries.

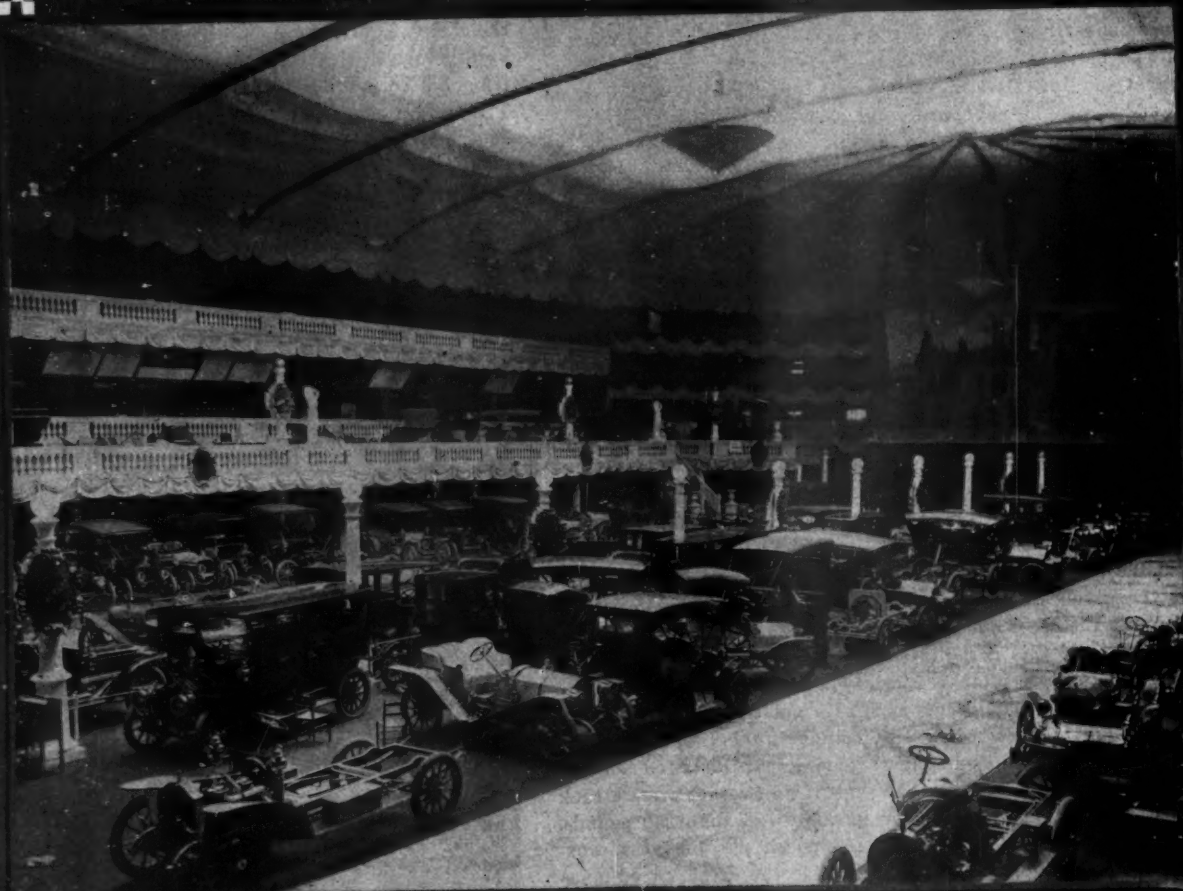
There is not a little talk at the stands about the coming 3 days' test which is to be the curtain raiser to the Chicago show. Makers whose cars have won victories on performances in sealed bonnet contests, endurance runs and 24-hour contests lay great store by them, seeing the publicity accorded these accomplishments in the reports of the show and having them dimmed into their ears by visitors who have just come from the stands of the successful ones. There is an undisputed inclination to get after Chicago run records that are likely to be such potent publicity and selling factors at the Coliseum exhibition.



HOISTING A CAR INTO PLACE



MAIN ENTRANCE FROM SOUTH



VIEW OF MAIN ENTRANCE FROM NORTH



MAIN ENTRANCE FROM NORTH EAST



EAST ENTRANCE FROM SOUTHWEST CORNER



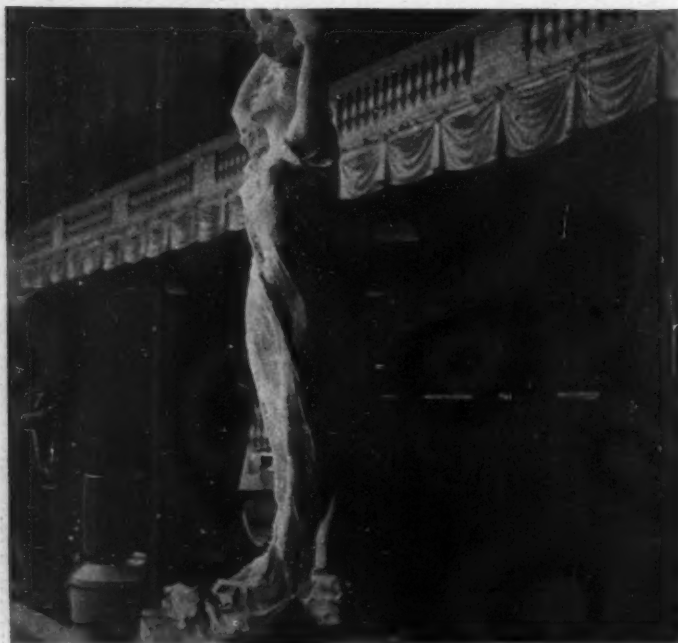
GIVING AN IDEA OF THE SHOW LAYOUT

THE extension of the platform further into the hall was a noteworthy improvement. It added coziness to the big, bare amphitheater and also helped out the terrace effect.

The red and the green taximeter cabs, which now swarm the streets, were eye-openers to show week visitors of what the near future will bring forth in their own homes.

Despite the broad freight entrance the handling of the cars was so bad that not a few of them had the doors closed on them. There should have been car-introducing platforms.

In the opening night crowd were noticed quite a bunch of Chicago branch managers and agents. Among them were: J. V.



ONE OF THE BITS OF STATUARY

Show

Lawrence, Pierce; A. J. Banta, Locomobile; J. B. Diebler, Haynes; A. M. Robbins, Rainier, and Frank J. Fanning, Autocar. It was noted, however, that Fanning hung up his coat and hat in the Haynes booth.

The Jeffrey and American Locomotive people continued their Rambler and Berliet exhibits outside the show. Garford and Rainier, of the independents, also opened exhibits at their garages. All of them advertised their private shows liberally.

In the Buick the A. L. A. M. has at last a low-priced four-cylinder car. It looked like a motor car, too. Its price drew a constant crowd of investigators.

One of the hits of the show is the big Pope-Toledo closed car built like an old English coach. The illusion was heightened by luggage being placed on top.

In the White booth is proudly displayed the Hower runabout trophy, which H. K. Sheridan won on the last A. A. A. tour.

It seemed like old bicycle show days to see Sam Miles and Bob Garden sauntering down the aisle arm in arm. Garden's daughter Mary, by the way, is shortly to make her debut at the Manhattan opera house as the bright particular star of Oscar Hammerstein's constellation of operatic song birds.

The trade changes of the past year were in striking evidence through George Bennett being in the White booth and Carl Paige and Harry Unwin at the Peerless stand.

Alexander Winton stoutly maintained in reply to all questioners that the six-cylinder has come to stay.

That no pent-up patent can confine the puissant powers of Publicity Promoter Jervis is proved by the fact that in spite of his being chief boomer for the Berliet and the Rainier, two independent cars, he also is found on the press agent staff of the licensed show.

That invariable first-nighter, E. R. Thomas, was an absentee. He is laid up in a Buffalo hospital, but expects to be out and at the show by next Thursday.

What looked like ventilators protruding along the top of the galleries are the mouths of the telharmonic megaphones. This music by phone is billed as a special attraction. A. H. Chadburne, well known to Philadelphia motor clubmen and



A GLANCE DOWN A MAIN FLOOR AISLE

Notes

tradesmen, is mixed up in the management of its producing company. Its notes are blared into every department of the show, but just the same the old-fashioned band scored the same old hit.

With Garford exhibiting at the palace and Studebaker at the garden, it was a case of six of one and half a dozen of the other.

Jim Becker is the only two-cycle exponent at the show. He has indeed nobly held the fort and by standing by his guns has repelled all attacks.

There were no foreign ambassadors to open this show, but it got there just the same.

It was remarked that the old Selden car was the first to start and the last to get to a motor car show.

A natty-looking private cab, of the depot bus type, is attracting a lot of attention at the Franklin booth.

A "business men's lunch" is served in the cafe at 60 cents.

Fewer makers in number showed six-cylinder cars than at the palace show, yet the percentage was greater, being 35.

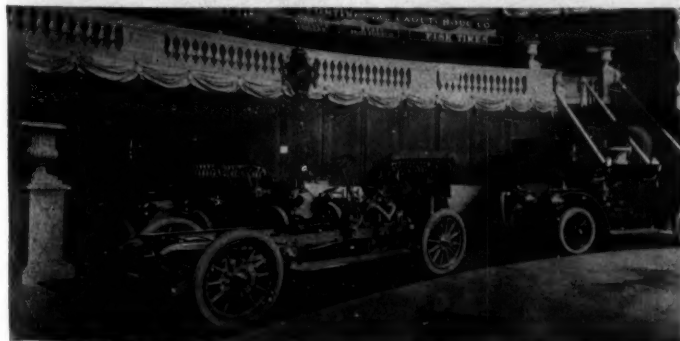
A really honest effort was made to keep all but workers out of the press room. A man stationed at the door did his best to stem the rush of the free lunch grafters.

The much-heralded Swiss guards were missing this year. In their places were a swarm of red-coated and capped, white-trousered, leather-putteed chauffeur attendants.

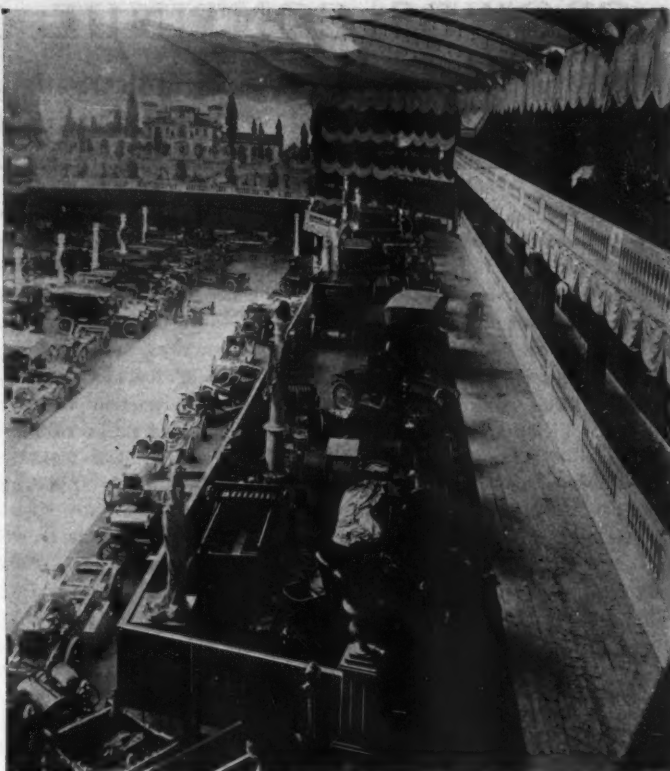
There was a shifting of stands this year, Franklin and Packard alone retaining their old locations.

The location of the telephone booths on the main floor in the heart of the show was a great convenience. Chicago, please copy and give us more booths than last year while you are about it.

All hands are laughing at that arch enemy of the licensed crowd, Thomas B. Jeffery, furnishing a Rambler to carry George Day, Colonel George Pope and other A. L. A. M. directors from



SHOWING GENERAL STYLE OF EXHIBITS



LOOKING DOWN FROM THE GALLERY

headquarters to the telharmonic reception. And the best of it all, Lazarnick got some photographs of the ill-sorted outfit en route.

The Autocar people made quite a how-de-do over having the only cars in the show with control grips on the steering wheel rim.

There are even larger crowds around the accessories booths than around the car stands.

There is a telautographic machine at the entrance which transmits messages to the managerial headquarters in Secretary Young's office.



MEETING OF MOTOR CELEBRITIES

CROWDS CONTINUE DESPITE MONEY TALK

Exhibitors Satisfied that There Is To Be Good Business, Judging from Interest of People in the Cars at the Show

NEW YORK, Nov. 5—Special telegram—Madison Square garden was the mecca of motor drivers on this election day. With perfect weather, the stock exchange taking a recess, the banks closed and business houses shut the forenoon, motorists flocked to the show for a holiday and to forget their troubles through talking car and viewing the magnificent array of machines the licensed makers have for 1908. Added to the city throng were hundreds who had driven to town from the suburban vicinity and from cities as far away as fifty or a hundred miles to combine a ride through the autumn-tinted country and a visit to the show as an ideal motoring holiday. The dollar admission evidently had deterred no one. The success of the show from an attendance standpoint has been assured. The enormous crowd at the garden last night and all the afternoon removed all doubt as to that. Appearances would indicate that the gate receipts cannot be falling much if at all behind those of last year. At the garden there is no sign of any financial crisis being at hand. Whatever money troubles motorists have they seem to have left them behind. The exhibitors and tradesmen are too busy with oratory and exploration to think of money troubles or talk of them other than in relating to difficulties they are having in diverting checks into ready cash for show needs.

It would be unreasonable to assume offhand that sales are being made to an extent that would justify characterizing the exhibition as a selling show; it is against reason to believe that much trying is being done during this panic scare and period of money hoarding. As a matter of fact, newspaper men are not being buttonholed in the aisles by exhibitors eager to hand out lists of purchasers, as always happens where selling is really going on. With so much smoke, however, there must be some fire. It is not to be conceived that all these crowds, all this interested examination of cars, will mean nothing when the scare is over, the hoarders begin to loosen up their purse strings and the open season once more comes around.

In this era of feature cars, buying ways and selling methods seem to have undergone a radical change. Salesmen do not so much point out particular points of construction and merit, as they rely upon gray matter persuasiveness; nor is there the crowding around the classes there was formerly. Visitors and investigators seem to prefer to sit on a comfortable sofa or in an easy tonneau and listen to the oratory of the administrator and on their own part talk, talk, talk car. There are near motorists now and the public itself is very generally wise to motor construction. It is really impossible at this show to separate the intruding buyers, the merely motor car interested owners and the general public visiting the garden to see the display and because the show is a Madison Square garden function.

The faces of not a few leaders of the licensed group have so far been missing. One has not yet seen Charles Clifton or E. R. Thomas or H. H. Franklin, for instance. Alexander Winton, Albert L. Pope, Frank Stevens, the Apperson and Lozier brothers, James Becker, E. H. Parkhurst, Elwood Haynes and William M. Wright are among the makers in evidence, and Charles B. Shanks, Hayden Ames, W. H. and A. E. Hildebrand and Adam Schaaf among the managers. One also sees Monarch Kiser and Frank Egan, of the old bicycle guard; Louis P. Mooers and Charles Duryea, of the independent camp, and Ralph Owen, of long-distance touring fame. Alfred Reeves, general manager of the A. M. C. M. A., has found time for one or two hurried visits before starting to spy out the European market for the independents. He sailed, by the way, on the Kronprinz Wilhelm today. A bunch of newspaper men and tradesmen saw him off and gave him a gold watch-fob medal as a parting souvenir from the Flat Tire Club.

A pretty well authenticated report is in circulation at the show today that C. H. Tangeman and Harry Fosdick, of the Hol-Tan company, have closed a deal with Louis P. Mooers whereby the Moon Motor Car Co. will build a car for them, to be known as the "Holtan," which is to be sold east of the Rocky mountains as such and be listed at \$3,000. The company, it is said, will drop the hyphen in its name and open a new garage on Broadway, its present building having been previously leased to the Rainer Motor Car Co.

American Automobile Association meetings will be resumed tomorrow, with a gathering of the full touring boards. Chairman Hower says, however, that next year's tour rules or route will not be discussed so early as this. The racing board will meet on Thursday and so will the directors. There will be a good roads convention on Friday.

Crowd Does Not Fear Dollar Admission

New York, Nov. 5—Special telegram—Perhaps it was a desire to get their money's worth, or maybe the motor craze is still on the rising wave, for when the price of admission to Madison Square garden was doubled Monday the crowd began to arrive early in the forenoon and it kept growing all day. The attendance, morning, afternoon and evening, was twice the size of what it had been on either previous day. It was a classy crowd, too, and as a rule it knew all about engines, ignition systems, carbureters, selective gears, cams, dogs and even baffle plates. Since J. B. Herreshoff, of the yacht-building firm, visited the show Monday, those who have anything to say about the lack of novelty are put to utter rout by the statement that there are many improvements and even a blind man can find them. Mr. Herreshoff is sightless, but his supersensitive touch tells him the make of car and almost at the first contact and after running his fingers over the engine parts he invariably finds something new in the arrangement. A mark of the motor craze that adds to the total attractiveness of the show is the fondness of the young women visitors for climbing into the cars and surveying the passing crowd in the aisles from an advantageous perch on the cushioned seats.

Some of the pretty ones who pose thus are merely friends of the salesmen in the spaces, but as it is a habit of the women buyers to try out the cushions of a car they look like cash customers when they settle themselves in the seats.



EDGAR APPERSON JOTS DOWN A FEW IDEAS

SOCIETY FOLK FLOCK TO GARDEN SHOW

Miss Gladys Vanderbilt and Her Fiancee
Impressed by Motor Coach—Six-Cylinder
Is Discussed—Other Happenings

NEW YORK, Nov. 5—Special telegram—The dollar admission brought to the show Miss Gladys Vanderbilt, the daughter of Mrs. Cornelius Vanderbilt, who a few days ago came into the absolute possession of a fortune estimated at \$12,000,000. The heiress was accompanied by her future husband, Count Laszlo y Zechenyi, of Hungary. The couple came on from Newport in a private car yesterday and expected to return at midnight, but decided to remain over for the purpose of attending the garden show today because of the interest that Miss Vanderbilt has in anything that has to do with motoring. The couple spent a full hour at the show, giving their attention mainly to the careful inspection of touring cars with limousine bodies. The future countess, in coming across a large car adapted to long-distance work, furnished as it is with trunks strapped to the top and added space for luggage in the back, exclaimed: "That is just such a car as I want." The salesman remarked: "We will be able to deliver you identically such a car in 5 weeks." "Please make a note of that," said Miss Vanderbilt to the count. Whereupon the count made copious notes in his pocket notebook. Passing on, the count's attention was attracted by a racetype car and observed to his fiancee: "Now, this is where I come in, I guess." The count looked over the machine and added more notes to his pocket notebook. Other visitors at the garden were Mr. and Mrs. William Ellis Corey, the latter the former actress, Mabelle Gilman. Mrs. Corey wore a stunning outfit of tan cloth, with hat, gloves and feathers to match. Mr. and Mrs. Corey seemed to be especially interested in an electric opera coach. Another visitors at the show on Tuesday was Mrs. Joan Cuneo, who has been a daily visitor since the opening. Mrs. Cuneo successfully drove her Rainier car to the finish of the Glidden trophy contest, although she did not have a perfect score.

Makers Talk Six-Cylinder Proposition

New York, Nov. 5—Special telegram—A review of the garden show and the palace show of a week ago reveals the same unsettled condition in the mind of the prospective buyer on the six-cylinder question, as many of the makers of sixes have outlined. The wise buyers who have followed matters since the outburst of the six question a year ago can talk nothing but three impulses per revolution and to them the six looks better on paper than anywhere else; but many of them have never ridden in a six and are ignorant of their running merits. Even with those well up in the motor industry there is much doubt as

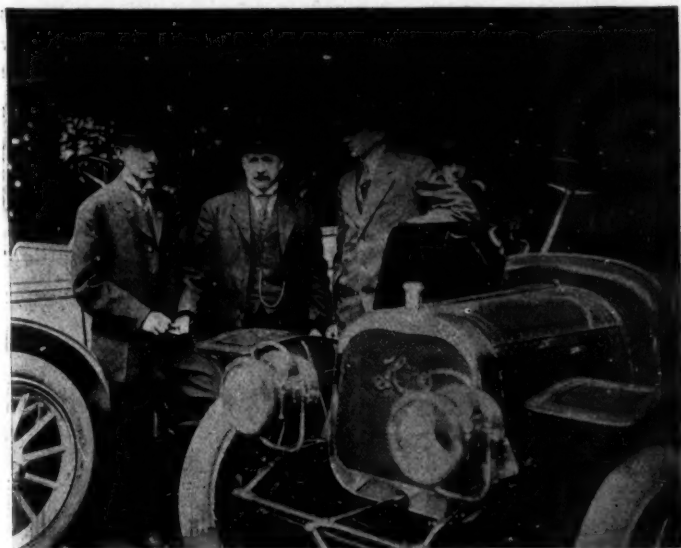
to whether the six has just come on the stage for a few months or whether it is here to stay. A few of the reputable makers who have been caught napping have nothing good to say for the sextette motor, but little attention can be paid to their arguments, because a year ago several makers who now show sixes were then talking bitterly against them. The average American car builder appears, from his attitude on the six problem, to be a most jealous-minded product, because if he has a six then the six is the best product, and if he has not gone into it he talks against it. Undoubtedly every maker has his actual estimate of the question, but he will not express it publicly. The large majority of show visitors who spend much time in the six investigation seem to be taken with the larger dimensions of the car in general and feel that by purchasing a six they will have a machine of an exclusive character and one which will attract more attention and provoke more comment than would a four-cylinder outfit. It is surprising how many like the long bonnet, the increased wheelbase and the bigger tonneau. The six has undoubtedly come to stay, but in many cases it will have to be considerably redesigned before it comes up to the proportional standard of the four. Over half of the makers of sixes in the garden have jumped into the game within the last 4 months and it is unnatural to expect a very attractive product in so short a time. To prove this assertion it is but necessary to quote indirectly from some of the makers who admit they had not time to get a proper flywheel and are using the same one employed on a four. Then, again, another concern will argue for lighter parts, but at the same time has not had time to manufacture lighter parts. Undoubtedly several—at least four or five—of the ten exhibitors of sixes have made them to have taking points and keep their names before the buyers. On the other hand there are concerns that for a couple of years have been working on sixes experimenting with them and designing for them and of course they are in the six game to stay and the final acceptance of it will be due directly to them.

Visiting Newspaper Men Are Dined

New York, Nov. 1—The Flat Tire Club, a luncheon organization of tradesmen and motor scribes, gave a dinner tonight to the visiting newspaper men. Of the latter fully a score were in attendance, proving how generally the show is being covered by the press of the country at large. President Schwarzkopf presided. Among the out-of-town scribes present were: J. T. Sullivan, Boston Globe; J. D. Murphy, Boston Herald; F. K. Pabst, Los Angeles Examiner; Frank B. Barnett, Los Angeles Automobile; N. H. Van Sicklen, Chicago Motor Age; E. Ralph Estep, Chicago; L. C. Boardman, Chicago American; J. E. G. Ryan, Chicago Inter Ocean; J. S. Patterson, Chicago Record-Herald; H. K. Clark, Chicago Evening Post; J. S. Bastar, Chicago Examiner; W. S. Gilbert, Cleveland Leader; H. McK. White, Philadelphia Press; G. A. Wahlgren, Motor Field.

Usual Sunday Crowd in Garden

New York, Nov. 3—Madison Square garden as usual today had a door open to exhibitors. There was the usual big Sunday gathering of tradesmen, scribes and photographers. Quite a crowd of eager outsiders managed to slip in also. There was no trouble found in having covers raised for inspection of the cars. In view of the magnificence of the display itself and the big crowd that was on hand the opening night despite the bad storm, optimism was rampant and hopes of a successful week ran high. In the press room it was given out that there was not half the paper distributed as at last year's opening. The hundreds of carriages and motor cars that blocked Madison avenue all the evening were instanced in proof of the statement that the crowd was essentially paid attendance. These were encouraging reports.



HAYNES' TALKERS, INCLUDING ELWOOD HAYNES AND FRANK NUTT.



IN ATTEMPTING an estimate of the progress made since last January in the art and science of motor car building by the members of the licensed association the difficulty of properly gauging real progress becomes almost a matter of impossibility, because, first of all, it must be determined what is real progress. Changes in motor design, as exemplified by one or two makers in the garden, scarcely can be taken as real progress, although the designers who outlined the changes doubtless believe they have made great progress in the changes. In one or two other cases changes made must be considered progress in that they are along the line of simplification of parts and removability of the same.

A French authority in stating that "when conditions are indisputable they are facts," came close to a good definition of progress; and in the language of every-day affairs "when any mechanism is designed on principles already tried and found correct and when in that design as few parts as possible are included and each part is made as accessible and removable as the occasion demands" then all steps made in that direction can consistently be construed as progress. This then is used as a guide to what should be a glance over what has been done during a 9-month lapse to see if the engineers have been working in the cause of accessibility, in the cause of simplification of parts and in the cause of preservation of the life of these parts.

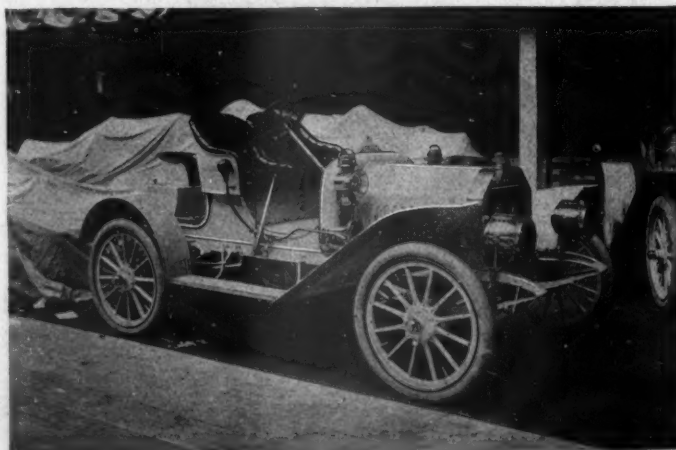
Most apparent is the efforts expended in encasing parts of the car that are subject to the invasion of dust, water and dirt and to which these agents work a great injury. The Elmore two-cycle engine has the shaft outside of the crankcase which drives the Atwater-Kent igniter, oiler and other parts encased, the shaft itself running on roller bearings in a tube and the bevel gears as well as the spur gears at its ends being housed in oil-packed cases. Designer Walter, in his Walter town cab with overhead valves, valve rocker arms and camshaft, has taken occasion to encase all the parts and provide them with the necessary amount of lubrication. Every maker deems it necessary to house in rubber boots the connections in the steering gear as well as the universal joints. In combining mud-exclusion and cleanliness the Pope-Toledo and the Peerless show enterprise in the mud aprons extending beneath the motor and gearsets. The Pope-Toledo has an easily-detached apron held to the frame side piece by hooks and eyes, much as the side of the motor hood are fastened to the frame, and in the apron beneath the motor are several round doors, large enough for the driver to get at parts of the motor such as drip cocks, oil overflow or carbureter connections and so eliminate the necessity of removing the mud apron bodily. These doors have a felt lining to prevent oil dripping and are held shut by means of a spring.

In the Peerless motor are a couple of plates forming the bottom of the crankcase and affording access to the lower connecting rod bearings. In the mud apron beneath them are swinging doors large enough to permit of a repair man working through them. In order to make the rear wheel brake drums dust-tight the Pope-Toledo concern has added a large felt washer between the drum and the plate enclosing its open end. In the Thomas town cab both brakes are expanding members and of half the width of the drum face, being positioned side by side. Still further in the dust-exclusion search is the locating of multiple-feed lubricators under the bonnet, by which transition the dash is made cleaner in appearance and the footboard cleaner in reality. Then, to go a step further, many makers are reverting to that

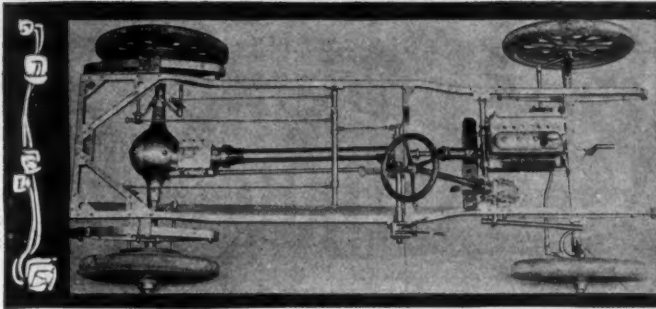
simple style of gear oil pump which they place in an oil well in the bottom of the crankcase and which pump sends oil in a stream to the motor bearings and cylinders. It is possible to hang the pump on the camshaft and so reduce materially the number of motor parts needed to drive it as well as having the advantage of no oil tubes outside of the cylinders which get in the repairman's way and are free to be bent and injured. Further, the increasing of the oiler capacity and carrying a separate oil tank under the chassis with connections to the reservoir so that by means of a plunger pump the oiler can be filled from the driver's seat and with the car running, must be construed as progress. The leading makers are using bronze or hardened steel bushings in the spring eyes and hardened shackle pins together with the fitting of a large compression grease cup for each spring eye. Universal joints carry extra large grease cups. In brief, the general fitting of grease cups to motor parts cannot be construed otherwise but as a sign of progress.

What are the evidences of progress in motor design? Unquestionably the discontinuance of constructions with little value and the corresponding increase in the introduction of good designs. Many points that might be classed under this head are unquestionably due to the fact that not a single engineer knows the ultimate goal of motor perfection and not knowing accurately the ideal shape of crankcase, cylinder, crankshaft and other parts, it is largely conjecture in passing upon such parts. The one-piece crankcase without side inspection openings, but with a pair of plates under the twin cylinder castings has the advantage of a stronger construction weight for weight than the two or three-part case and the danger of oil leaking is lessened. Then, too, makers have come to the conclusion that with one or two exceptions it is impossible to take up bearings through side plates. When this has been done, and done right, the car requires to be run over a pit and the work effected in a garage or repair shop. The Peerless people introduced a one-piece case and now the Stearns, in its ball-bearing motor; Walter, Thomas taxicab and a few others have come to it.

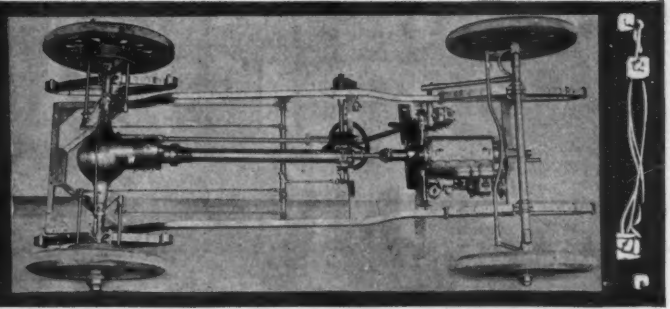
What looks right and has been considered right in mechanical engineering for years has been introduced on the new Haynes car and adapted to the continued big Haynes model. This is the use



BUICK'S SENSATION—THE \$850 FOUR-CYLINDER



TOP VIEW



CHASSIS OF THOMAS CAR

BOTTOM VIEW

of two flywheels, one at the forward end of the crankshaft and the other at the rear end, the front wheel weighing 50 pounds and the rear wheel anywhere from 100 to 125 pounds, according to the horsepower of the motor. In the conventional motor with one flywheel on the rear end, the entire work of the crankshaft is done from that end and the forward end is left free to drive the camshaft and perhaps the magneto, oil and water pumps—an inconsequential task in comparison with that of driving the car. Using the forward flywheel holds that end of the shaft steadier, eases the work on the motor in general and reduces what has come to be called the whip of the crankshaft. Abroad the French concern, Motobloc, has used a flywheel between the double cylinder castings and in America scores of makers have said that the double flywheel is right, but up to the present all of them have been apparently afraid to use it. In this connection the Stevens car must not be overlooked. For years the Stevens flywheel has been on the forward end of the crankshaft, the company claiming the disk clutch and other parts are sufficient flywheel on the rear end. Here is a point where it is impossible to state which design is on the road leading to ultimate perfection.

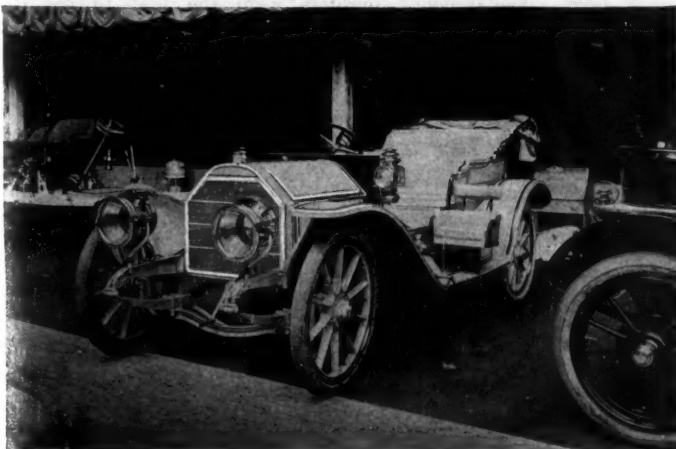
As to whether cylinders should be cast in pairs, or cast separately, cast with valves on one side or with valves opposite, cast with integral waterjackets or furnished with copper waterjackets, cast with valves in the head or in side chambers, nothing definite can be said. No engineer has definitely determined which design is right. With the continued use of the manograph and other scientific instruments it may be possible to arrive at a proper solution of the shape of the cylinder casting, but until that time it is expected that the various makers will continue to pursue the course they have followed consistently for several years. For example, Pierce and Stevens sixes, Apperson, Thomas, Autocar, Cadillac, Pope-Toledo and Elmore will use the separately cast cylinders and Packard, Locomobile, Lozier, Stearns, Oldsmobile, Pope-Hartford, Royal, Buick, Studebaker, Thomas-Detroit, Walter and Winton continue in the use of twin-cast cylinders. The air-cooler of necessity will retain the single-cylinder casting. Theoretically viewed, a buyer might be pardoned for concluding that a motor with valves in the head is more economical and efficient than those with valves in side chambers, but in conjunction with the open-

ing valves in the head the proper exclusion of dirt from the exposed parts and the efficient lubrication of all parts are problems that competitors claim more than offsets the thermic advantages.

Undoubtedly it is correct to reason along the line that any particular construction, which the majority of makers has imitated and successfully used for several seasons and which construction satisfies in most respects the criticism of the multitude and which, per se, will be semi-immediate if not the ultimate goal made, is in the cause of progress. Analyzing cars on this basis a few of the following conclusions are in order: Selective gearsets as seen regularly on such models as Haynes, Locomobile, Apperson, Knox, Matheson, Walter, Corbin, Oldsmobile, Thomas, Sterns, Peerless, Winton, Pope-Hartford, Columbia, Lozier, Elmore, Studebaker and Selden, cannot be considered other than as leaders in their class. Although there is not any claimed mechanical advantage in driving through a selective set as compared with a progressive set, yet the advantages in the convenience in handling the selective set cannot be overlooked. At present five of the leading licensed makers continue to use the progressive sliding set, these being Pierce, Packard, Royal, Stevens sixes and the Autocar. Planetary gearsets used on a couple of makes of cars have advantages on low-priced machines that cannot be gainsaid, and their ease of operation marks them as good for several years yet in this class of car.

Undoubtedly the magneto, in offering a permanent electric current producer, is a mile-stone in ignition progress, for, in the words of Lincoln, "you may fool some of the people some of the time, but you can't fool all of the people all of the time." Judging from the following the magneto has had in European countries for 3 or 4 years and the clientele it has gained in America in a couple of seasons, it is meeting with the universal approval of the American builder and buyer, and the only reason it is not still in more general use is the high price at which it is sold. All of the high-priced cars at the garden have a geared magneto, some of American build, others of foreign construction, but in only one case does a maker deem a high-tension magneto alone sufficient for his ignition scheme, the remainder of them attaching the magneto but using a storage cell for reserve work, truly not much of a compliment to the magneto, or perhaps it is intended for the driver of the car. It is true, magnetos are not very well understood by many drivers, and often if so-called magneto troubles were traced to their origin the fault might be found to rest with the driver.

Few critics would like to take the stand that lengthening the wheelbase and increasing body size is a true criterion of progress and whereas some makers have added 1½ inch to the wheelbase others have made an increase of over a foot. The 125-inch field seems a reasonable average for the five and seven-passenger cars, and those who have been slightly below this are approaching it inch by inch; those who built cars with 110-inch wheelbases or thereabouts are adding over a foot to the car's length. Engineers deem 125 about right for the average American city street and country road, and while several cars run as high as 130 and some up to 132 inches, yet buyers feel that over the 130-inch maximum is getting pretty long. The six-cylinder car has slightly changed the wheelbase attitude, but even in this class of car the aim has been not to lengthen the axle distances beyond a few inches.



STEARNS TOURABOUT, A STYLISH CREATION

Tendencies in Motor Car Construction

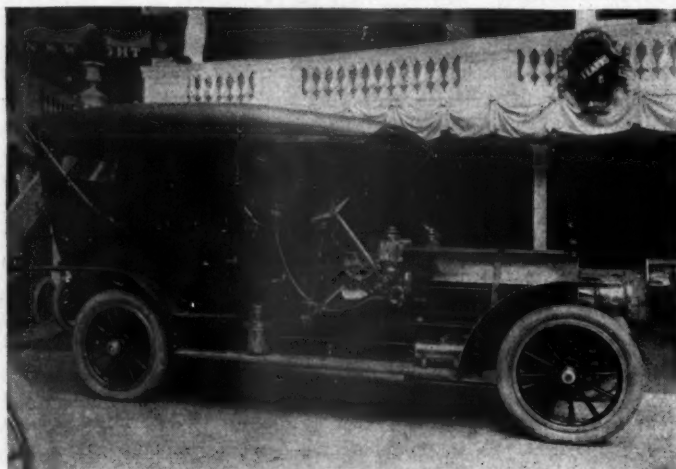
IN ORDER to draw a clear line of demarkation between progress and tendencies, the latter must be looked upon as the varied improvements in the thirty or more makes of cars shown, irrespective as to whether these changes will ultimately prove correct or not. Tendencies are then the changes reviewed in the light of the present and not measured according to their possible status a decade or century hence. It will be sufficient to group together many interesting changes in motor transmissions, running gear components and body lines, leaving the reader entirely free to infer as to whether the changes will be recorded as epoch-making or as merely whims of this or that particular designer whom fate or circumstance has thrown into his present position.

In treating tendencies under different department heads, perhaps that of running gears comes first, and in this the question of wheel size presents itself. The Peerless cars are fitted with 36-inch wheels for the first time, the 60-horsepower Haynes has been similarly equipped; the Pope-Hartford has jumped from 32 to 34; the four-cylinder Oldsmobile has the same size as the Pope-Hartford; the six-cylinder Oldsmobile has 36-inch wheels; the Royal Tourist has left the 34-inch classification and entered the 36-inch ranks. So the wheel story goes, cars selling at \$3,000 or over all, or approximately all, fitting 36-inch wheels, and those retailing at \$2,500 to \$3,000 using the 34-inch size, whereas those under the \$2,500 mark carry the 32-inch and 30-inch sizes. The increase in wheel sizes has come largely as a matter of economy demanded by many users who have found that a car of certain weight should be fitted with tires of a certain diameter.

More than ten makers have increased the strength of the rear axle, this change being confined to the users of shaft-driven cars. One maker increases the diameter of his axle drive shafts and axle tubing $\frac{1}{8}$ -inch, another maker augments the size of the differential housing and webs it a little more. Another maker adopts the floating axle in order that the drive shafts may be withdrawn without taking the axle out of the car. The Packard company has adopted a novel strengthening scheme by placing the differential case webs inside of the case which makes the housing an oval-shaped piece with a smooth exterior. Among many makers a strong point appears to be the attempt to house the propeller drive shaft and so use but one universal joint in the transmission from the gearset to the back axle, this universal being just ahead of the forward end of the shaft tubing. Some makers expend great effort in supporting the forward end of the shaft tubing on a crosspiece of the frame, whereas others are content to let it rest on the shaft, inserting a roller bearing between the end of the housing and the drive shaft. Go to the next exhibit stand and you encounter a concern like the Stevens which has used the enclosed driveshaft on its six-cylinder cars and on its new four-cylinder style, and you find the driveshaft tubing is dispensed with and two universal joints placed in the driveshaft, one at the forward end and the other at the rear end.

The rear platform spring is perceptibly gaining in favor, as is the full elliptic rear spring. A few years ago the Peerless and Lozier were about the only exponents of the platform rear spring in the licensed class, but now the Royal Tourist is so fitted, the improved Elmore has it in place and the new Stevens four-cylinder is so equipped. The Oldsmobile four and six-

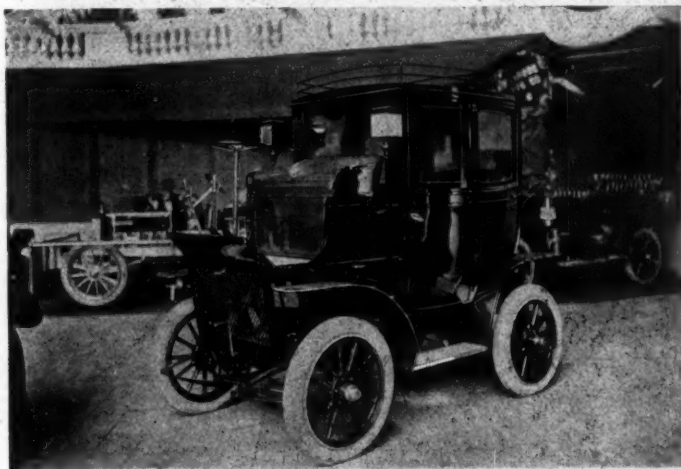
cylinder cars have full elliptic rear springs; the Buick model F has discarded semi-elliptic rears for full elliptics. Many users of semi-elliptic have preferred to solve the spring problem in a different way, namely, by the use of a superior grade of metal. Peerless, although not changing in suspension, has added Le-moine springs, made from silico manganese steel. The Apper-sons retail the semi-elliptics but use a vanadium alloy steel. Other makers show springs with longer and wider leaves than formerly and with chrome nickle steel in their composition.



NEW SIX-CYLINDER THOMAS TOURING CAR

The prophet who a year ago saw no changes in car frames has made an error; not a very great error from the standpoint of construction, but a great one when the result obtained is considered. This change is that of dropping the frame side members in front of the back axle or arching the side member above the axle. The result gained in both cases is the same, namely, a lower body hang and greater spring movement in the rear. By doing this a concern using 34-inch wheels a year ago can use 36-inch wheels and not raise the body; on the contrary one or two makers have added 2 inches to the wheel diameter and have the car body actually lower than when the smaller wheels were used. The Renault builders were the first to use the dropped frame abroad and the Peerless company the first in America. Those makers who have increased the wheelbase materially have strengthened the frame side members by increasing the channel depth, and others like the Matheson have placed a truss rod under each side piece. The Northern company continues the use of its angle metal frame, the Franklin cars their wood frames, the Pope-Hartford its armored wood frame and the Pope-Toledo its inverted U channel frame. The remainder of the makers use the conventional pressed steel frame, some with subframe for the motor and gearbox and others without. Every maker whose car price warrants it places internal and external brakes on the rear wheel hubs. Only in low-priced machines or chain-driven cars are the brakes not so placed. Camel's hair lining suits one maker and steel against bronze another, while a third is only content with cast iron against steel. Nearly every maker has increased the brake diameter slightly on his models for 1908.

In a motor considerable attention is directed to the practice followed in the new Haynes' motor and also in the redesigned Stearn's crankcase, of housing the mechanical oiler and water pump in the motor supporting arms. The Haynes has the front supporting arms of large size and places in the right front one the McCord oiler and in the left an oil tank; whereas the Stearns carries a Lavigne oiler in the right front motor arm and the water pump in the left arm. Next year many makers will have copied these constructions, as they provide very suitable positions for these motor accessories and accentuate materially the clean-cut appearance of the motor as well as administering to the cause of accessibility. Webbing of the crankcase between the supporting arms is on the increase, as it simplifies the supporting of the water pump, oiler, carbureter and magneto without causing any annoying interference to motor examination. There is not any reason why additional use should not be made of the space between the motor arms for housing these parts instead of placing them high on the tops of the motor arms or steering gear post where they impair the accessibility of the valves. In the space between the supporting arms could be a cast compartment with cover, in which compartment many of the motor accessories could be placed where they would



NEWLY DESIGNED FRANKLIN CAR

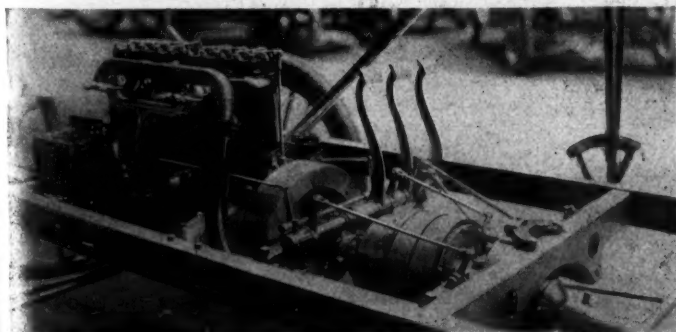
be free from dirt and out of the way. Those makers who placed the camshaft outside of the crankcase are now placing it within it on their new motor models. The approved construction is to insert the camshaft endwise into the case.

Not only is this construction confined to the camshaft, but a few makers, notably those using one-piece crankcases, insert the crankshaft through end openings in the case so that it, too, may be removed without dismounting the motor. In the problem of motor support attention appears to be directed to the use of manganese bronze or other bronze alloys for supporting the crankcase and motor on the car frame instead of entrusting its support to the aluminum arms of the crankcase. The Locomobile people have for years used bronze in the top half of the crankcase and the center part of the gearcase; last year the Pierce maker discontinued the integral aluminum motor sup-

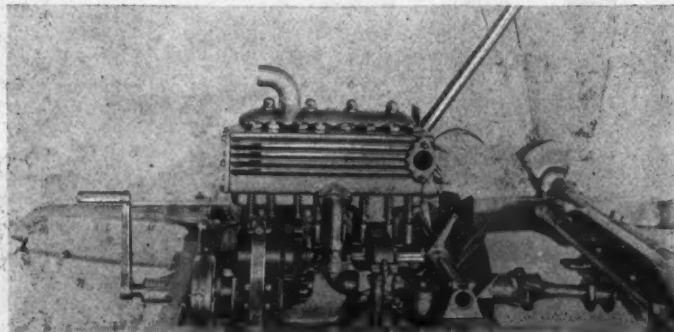
port arms and substituted cross members of bronze alloy which rested upon the frame sidepieces and were bolted to the crankcase. This year the Buffalo Thomas cars are using separate transverse bronze supports. The Walter car exhibits a three-point suspension comparable with that employed on C. G. V. cars, namely, a trunnion center support at the forward end in which the motor rests on a U piece, the arm extending under the forward part of the crankcase and the curved part trunnioned to a crosspiece of the car frame. At the rear end of the motor are two rigid integral supports. The Stevens sixes and the new four continue carrying the motor and gearcase as a unit on a three-point support, and other makers are generally continuing with the conventional four-arm support. The new Apperson cars have the timer for an electric system carried on the top of a vertical shaft on a level with the cylinder heads on the right; the new four-cylinder Stevens carries it on a short vertical shaft on the right opposite the rear cylinder pair; the new Pope-Toledo has it on a vertical shaft which runs in a housing; the Peerless houses its timer shaft as do several other makers, the tendency being to carry the timer or distributor, as the case may be, on a vertical shaft on a level with the cylinder heads and to house the shaft so that oiling is better.

Thermo-syphoning is not on the increase excepting that it is used on the Thomas taxicab. A slow change noticeable is that of passing from the rotary pump to the smaller gear style, many makers not making the change because of lack of efficiency in the rotary style but because the rotary must be of large diameter, whereas the gear pump has small-diameter gears.

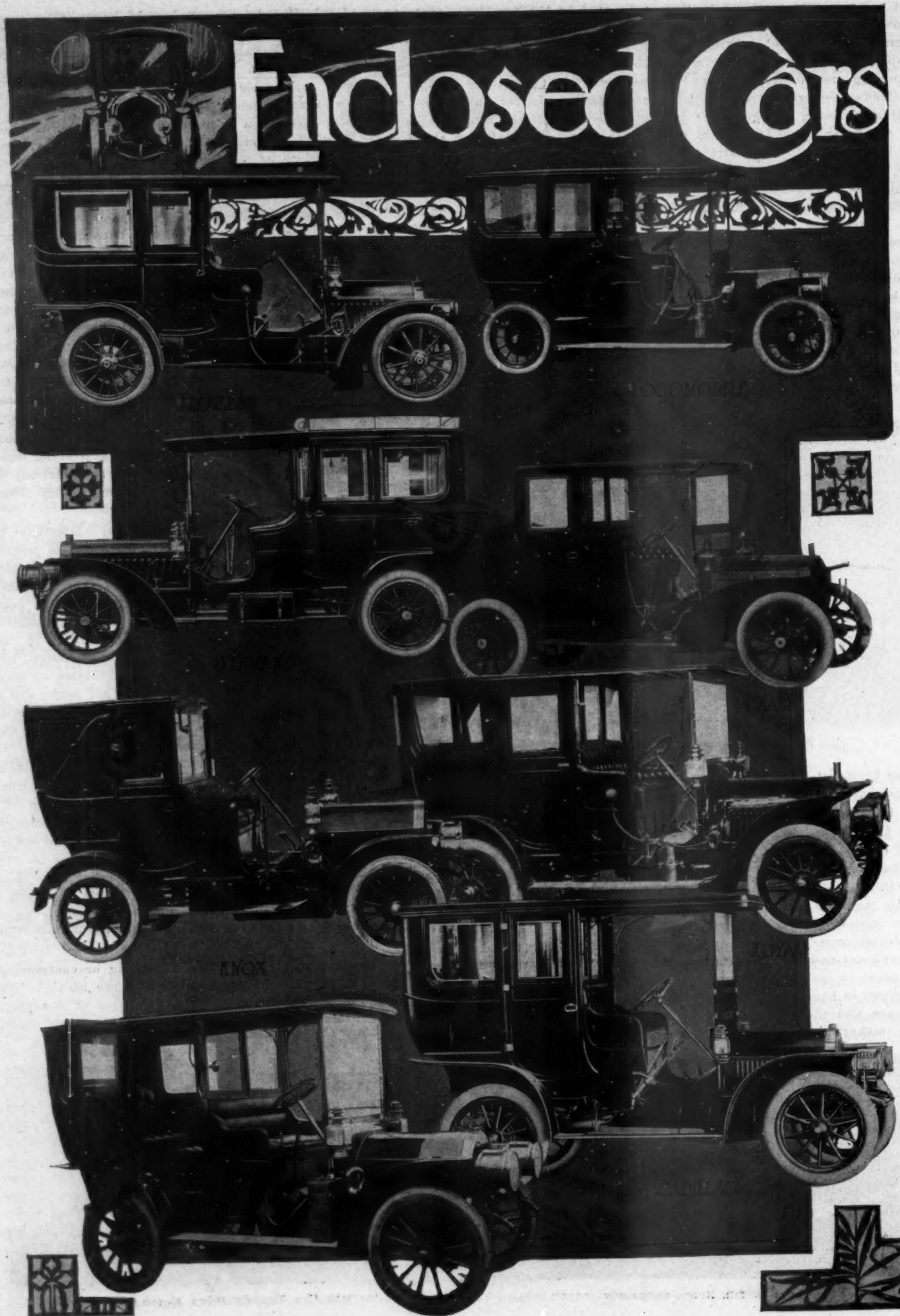
The air-cooling has at first glance suffered materially in that the Franklin concern is the only one to stick to this process of heat radiation. On the other hand, such firms as Corbin, Knox and Waltham have become fence-straddlers, showing either air or water-cooled machines, the reason advanced for its position being "that the dealer may have cars to satisfy the desires of the buyers who want either air or water-cooling. In the case of the Waltham the motor is an entirely new design, but with the Knox and Corbin the crankcase is the same as used with the air-coolers, only water-cooled cylinders are made, and a water pump, radiator and water piping added. The Premier company a year ago changed from air to water-cooling in the same manner. The Franklin company sticks by its guns. It continues air-cooling but has altered its method in a few details, chiefly in the use of bronze cooling fins instead of cast iron, the reason being that bronze, such as used, has a cooling efficiency of five to one as compared with cast iron. The company also varies the radial depth of the cooling flanges on the different cylinders and also increases the number of flanges on the second and third cylinders, the third cylinder having more than the first, second or fourth and the second and fourth having the same number. Cone, disk, expanding and contracting band clutches are still combatting evenly for supremacy, all apparently holding their own. A noticeable feature is that those who are at present using cone, expanding or contracting clutches have continued with them in spite of the multiple-disk clutch invasion. They claim to have no intention of changing, which seems to prove that any of these styles, if properly made, is a satisfactory connection between the motor and gearset.



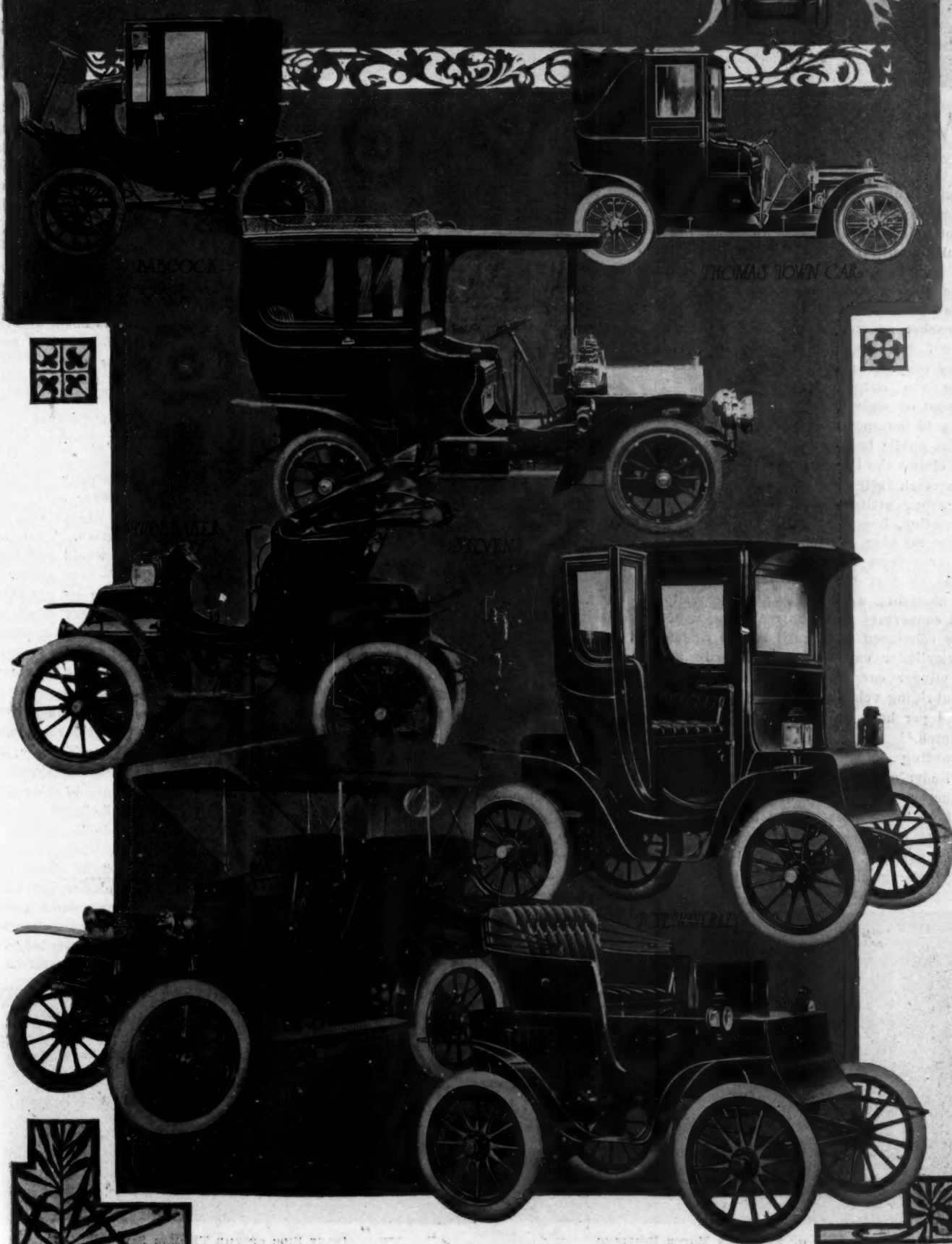
MOTOR IN THE BUICK SENSATION



THOMAS CAR FOUR-CYLINDER MOTOR



for 1908





1 5 3 6 2 4

Sixes at the A.L.A.M. Show

1 3 2 6 5 4

"WE HAVE made the Franklin six what any six-cylinder car should be, namely, a car with more power and less weight per horsepower. Our purchasers claim to have more trouble with sixes than with fours and reports show that there is no perceptible difficulty in operating a six-cylinder car as compared with a four." In these words F. R. Bump, of the Franklin company, set forth the aim of this Syracuse house in producing six-cylinder machines as well as outlining what the general opinion of the owners of these cars hold. In talking on the Franklin six, which is one of the pioneer American sixes, Mr. Bump told of bringing out in the autumn of 1905 the first Franklin six and placing it on the market as one of the 1906 models. The output of sixes for 1907 was doubled, the sales exceeding the expectation of the company. For 1908 the company has planned to more than double the output of this season. The entire Franklin argument on sixes is more power and little weight, the Franklin having 42 horsepower and weighing 2,500 pounds.

"The public has wrong conceptions regarding the six-cylinder car," claims the Peerless man. "They all see a six and imagine it is a much faster car than a four and a road locomotive. This is a wrong attitude with which to approach the six-cylinder construction, because the six has not been built primarily as a speedier car than the four but as a more comfortable riding car, a car free from vibration and a world-beater in climbing hills because all that has to be done is give a little more throttle when ascending a hill. The average visitor at the garden show is not conversant with the real six-cylinder superiority and will not be convinced of it until he has ridden and driven in a six. A six-cylinder car is not necessarily a speedier car than a four-cylinder car of the same horsepower, but it is a more palatial-riding vehicle and one which can be driven to as low as 4 miles per hour on direct drive without releasing or slipping the clutch."

According to Pierce ideals, the primary proposition in six-cylinder architecture is the increasing of motor power with a reduction of the cost of car maintenance. A six-cylinder car of 43 horsepower can be built lighter than a four-cylinder car of 45 horsepower, they say. The six-cylinder little Pierce weighs exactly 420 pounds less than the 45-horsepower four-cylinder machine. Gears in the transmission of the six are

lighter than those in the four; the annular ball bearings carrying the shafts can be made lighter and a six-cylinder car with longer wheelbase and the same carrying space as a four can be several hundred pounds lighter.

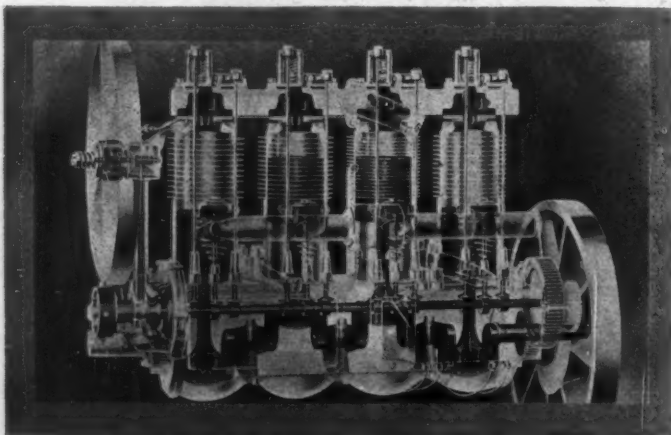
"Few show visitors understand the advantages of the six-cylinder car but when these advantages are explained to them they immediately get interested in the six-cylinder car." This was the opinion broadside of C. B. Shanks, of the Winton company. Continuing, he said the Winton six motor weighs 42 pounds more than the 1907 Winton model M motor, but that the transmission in the six is 50 pounds lighter and in addition the whole car construction is lighter. "The six is not a question of added power as compared with the four; rather, it is a more economical and even application of the motor power," says Mr. Shanks. "The many talked-of problems in the six-cylinder are all magnified by the person who has not used one. Carburation is easier in a six than in a four because there always is a constant pull on the six carbureter, whereas in the four the pull is intermittent."

According to Edgar Apperson, the great inquiry of show visitors is "What do you think of the six-cylinder car?" All the visitors appear puzzled about the sixes and are seeking the opinion of the makers and are after information. They ask the manufacturer, "If you were buying, which would you take, a four-cylinder car or a six-cylinder machine?" One visitor at the Apperson stand advanced the argument that he did not think the advantages gained from the two added cylinders offset the additional troubles of ignition and carburation. Mr. Apperson claims that for speed under 20 miles per hour the six is superior to the four, but for all rates above that he cannot see much advantage in the former.

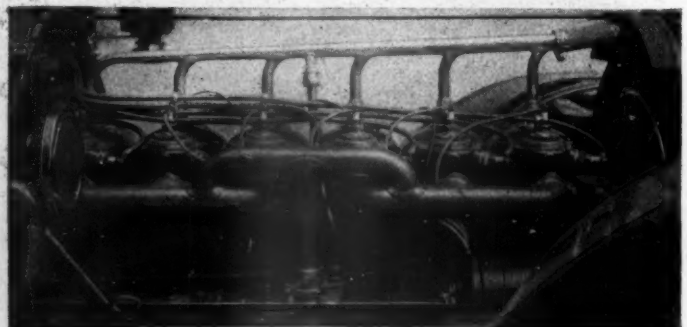
Nothing in motor construction has presented in recent years so curious and so diverse a set of conditions as does the firing sequences in six-cylinder cars as exemplified by the two shows. Here are the eight possible sequences arranged in parallel columns for convenience in comparing:

1-2-3-6-5-4	1-4-5-6-3-2
1-2-4-6-5-3	1-3-5-6-4-2
1-5-4-6-2-3	1-3-2-6-4-5
1-5-3-6-2-4	1-4-2-6-3-5

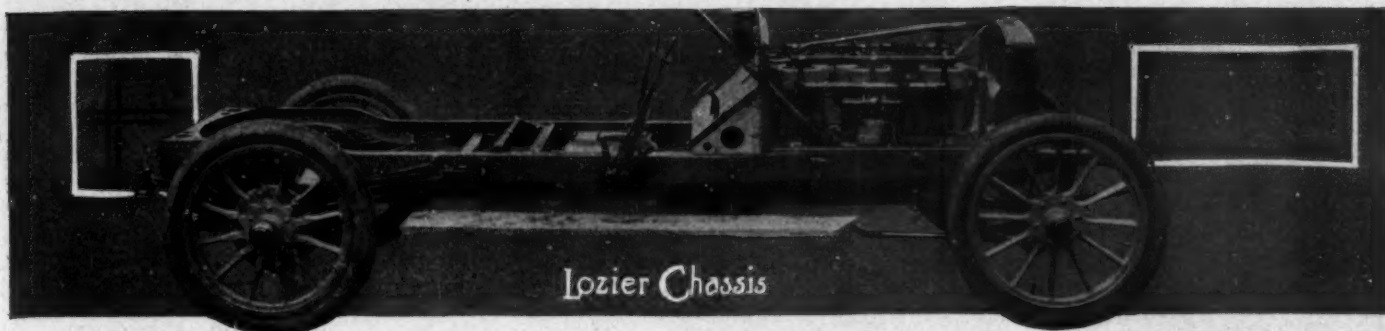
It will be observed that any right-hand column group or sequence is merely the reverse of the left-hand column group on the same line, and that each will make the same diagram if plotted. This can be better understood if a sketch lay-out is made of dashes to represent the wristpins on the crankshaft,



AN EXAMPLE OF FRANKLIN MOTOR BUILDING



INLET SIDE OF THE THOMAS SIX



remembering that when cranks one and six are at their top-stroke position, cranks two and five are on their up-stroke and within 120 degrees of top-stroke position, and cranks three, one and four are at 120 degrees on their down-stroke. Looking at the crankshaft from one end, the sequence would be 1-4-2-6-3-5, say as the firing order of cylinder numbers. If that crank were put in the engine end for end it is certain the cylinder sequence would be 1-5-3-6-2-4, and the same holds true of the other parallels. This is one peculiarity that not a single factory man, designer, or tester at either show realized; in fact, many when asked the sequence used by them answered by stating, "Why, we use the regular order, same as the other makers do," which served to call their attention to the above eight possibilities and here is the final result as shown by the tabulation made: Sequence 1-4-2-6-3-5 embraces Apperson, Austin, Berliet, Franklin, Lozier, American Mors, Oldsmobile, Premier, Stevens-Duryea, Stoddard, Trebert, Welch and York, giving thirteen as the total. In the balancing sequence of 1-5-3-6-2-4 there comes the Marion, Pierce, Thor and Winton, the grand aggregate being seventeen. The next in order of users are two sequences of five users each, one being 1-3-5-6-4-2 with the Gearless, Glide, National, Stearns and Thomas, and the other, 1-2-3-6-5-4, leaving Acme, Ford, Frayer-Miller, Mora and Napier as exponents. Curiously enough the balancing sequences of 1-2-4-6-5-3 and 1-4-5-6-3-2, respectively, leave neither of them an exponent. Now comes the remaining number groups, that of 1-3-2-6-4-5 and of 1-5-4-6-2-3. The first of these is used by Chadwick and Colt and the last by Peerless, giving a total of three in the parallel. In intake manifolds there are also discrepancies and while there appears to be many ideas an analysis shows that the conditions are brought down to two, one where the argument is sustained that the gas travel should be equal in distance to all cylinders, from the carbureter, and the other where the opponents maintain that the first named are over fastidious, as there is no need of this if the carbureter and piping are of proper size.

There is also a wide angle of demarcation in flywheel weights, running from 32 pounds at 17 inches in diameter to 110 pounds at 20 inches in diameter. The conditions here, however, are not so empirical as in the firing and manifold illustrations, as it only needs slight study and inspection to prove that in many cases convenience only has been consulted in its relation to the goods on hand; in other words, the flywheel used is merely a case of taking the regular four-cylinder flywheel and using it. Comparatively few seem to have gone to the point of

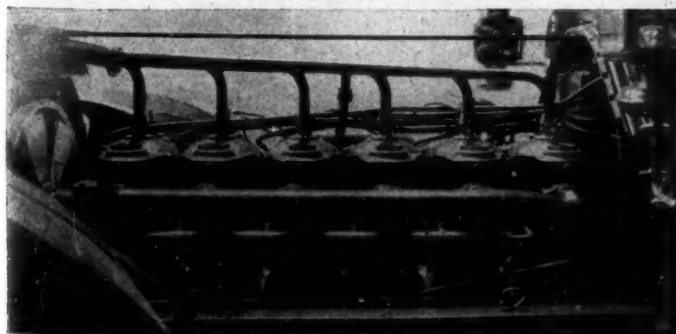
making a special flywheel for the six. In other instances the four-cylinder stock flywheel has been machined down to a lighter weight as a seeming compromise. The same general observations can be made of the speed-changing ratios in the gearbox. In other details it will be noted from the descriptions given that these are of the kind that come as much from the price at which the car is sold as anything else, measurably backed up by usages based on four-cylinder experience, where the cylinder number is not the essential factor.

The six-cylinder situation at the A. L. A. M. show is a strong one, wherein ten makers, or 35 per cent of the manufacturers of gasoline machines in the A. L. A. M., show this latest trend in motor cars. This is further strengthened by one member of the association, who makes this the sole model produced, the Winton Six-Teen-Six. The other makes are the Stevens-Duryea with two sizes, the Pierce with two sizes and Apperson, Franklin, Lozier, Olds, Peerless, Stearns and Thomas, each with one size.

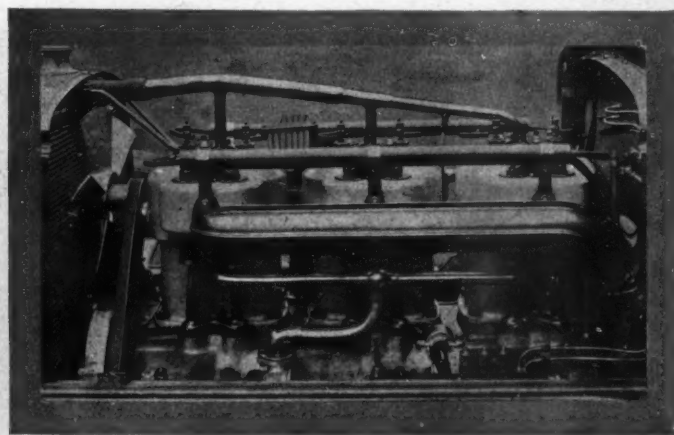
Only one motor maker shows a six product, the same Thor that was at the A. C. A. show, the promised Brennan not materializing.

To the largest class of firing order of the sixes made in this country belongs the Apperson with its sequence of 1-4-2-6-3-5, there being seven plain bearings, with the cylinders cast separately. The manifold is a straight short-stemmed T, the header having six short leads. This type is used instead of the double-headed T type because the designer believes that, except at rarely low speeds, the latter is not necessary if the manifold cross area is large enough. This component is not a casting, but is made up of tubing as at present shown. The cylinders have a bore of $4\frac{1}{2}$ inches and a stroke of 5 inches. They occupy a space of $30\frac{1}{2}$ inches and have a clearance of $8\frac{1}{2}$ inches, the under-the-bonnet measurement being 39 inches. The flywheel measures 20 inches across and weighs 100 pounds, the power delivered passing through four speeds at the gear box. Ignition is by magneto and battery and oiling by force feed.

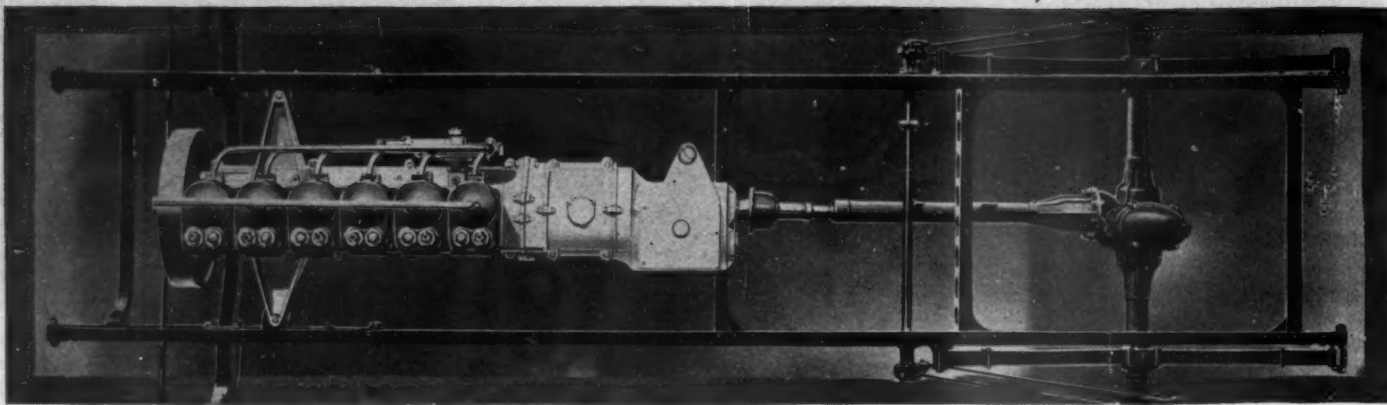
Another member of the larger group of firing sequence is the Franklin, with the order of 1-4-2-6-3-5. The manifold is of the design that has the ends of the T head each branching into a T of its own of unequal length as to the final branches. The possible stratification is taken care of in these by constricting the two end discharges to the intake ports, as the three leads



EXHAUST SIDE OF THE THOMAS SIX



CONSTRUCTION OF THE LOZIER ENGINE



CHASSIS OF THE LIGHT SIX-CYLINDER OF THE STEVENS-DURYEA FAMILY

from each to the separate cylinders are of unequal distances from the carbureter. The separately-cast cylinders have unequally placed radiator fins, both as to spacing and as to up-and-down length; that is, the cooling fins are not symmetrical throughout the group of cylinders making up a motor. The crankshaft has seven plain bearings and carries a flywheel of 21 inches in diameter and 60 pounds weight. The regulation three-speed drive is used as on the fewer cylinder number cars. The motor, with its $4\frac{1}{4}$ -inch bore and 4-inch stroke, occupies a space of 40 inches under a bonnet with 50 inches clearance. Ignition is by magneto and battery and oiling is by force feed.

In the Lozier again is met an example of a firing sequence 1-4-2-6-3-5 and a double-headed T as the manifold design, there being a globe enlargement at the junction of the stem and the first head. The cylinders being in pairs, the final lead is by three equally-spaced exits. The over-all measurement of the cylinders, which have a bore of $4\frac{1}{2}$ inches and a stroke of $5\frac{1}{2}$ inches, is 37 inches, and the under bonnet clearance is 43 inches. There are four bearings, and these are of the ball type, the crankshaft carrying a 90-pound flywheel of 17 inches diameter. There are four speeds for the drive, with the direct on the third. Ignition is by magneto and by battery and oiling is by force feed.

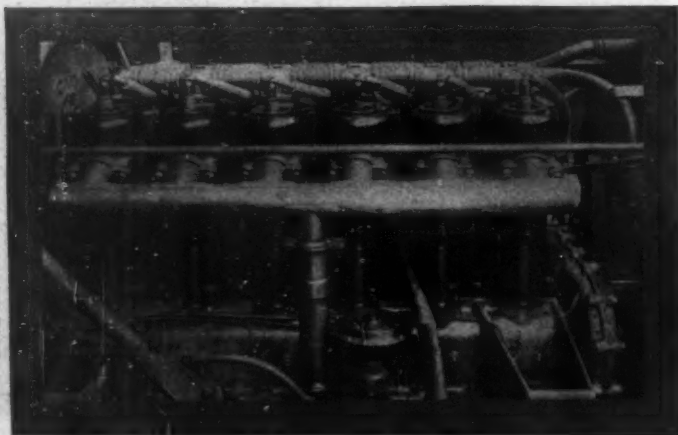
The Oldsmobile also is of the majority firing order, the sequence being 1-4-2-6-3-5. The manifold has the same position, it being in effect a double-headed T, but in design avoiding the second longer parallel tube and presenting the appearance of a plain T. This is accomplished by having the junction at the upper end of the stem of large cross area, which then tapers both ways toward the ends. To make the distance from the carbureter to the central exit above the stem the same as to either end exit, there is cast inside the aluminum manifold a horizontal web or baffle plate reaching far enough each way to give the distance result desired. The cast-in-pairs cylinders are $4\frac{1}{2}$ bore by $4\frac{1}{4}$ -inch stroke, and measure over all $37\frac{1}{2}$ inches, the bonnet clearance being $45\frac{1}{4}$ inches. The crankshaft bearings are four in number and run on balls. The flywheel measures 18

inches in its diameter and weighs 98 pounds. Power is delivered through three speeds. The oiling system remains in that direct class where the crankcase has a sub-base for an oil tank from which delivery is taken by means of a gear pump inside the case.

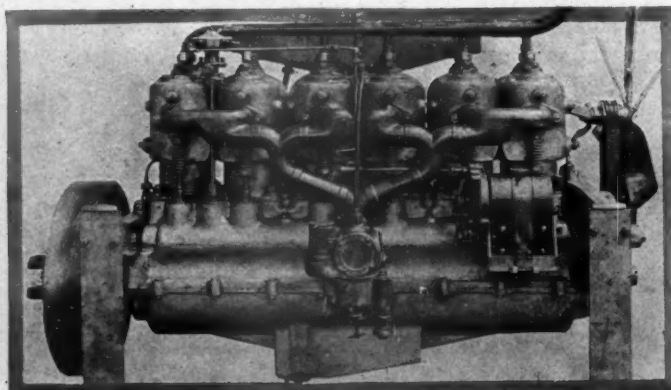
In the Peerless six there is found a firing sequence not before met with, leaving but two sequences of the possible eight that so far are yet to be put in the list as used. This sequence is 1-5-4-6-2-3 and diagrammatically balances 1-3-2-6-4-5, of which there were two at the A. C. A. show.

The manifold design comes under the double-headed T classification, the main branches, however, curving up enough to give a flattened Y, the branches of which lead into a cross tube that is like two bows end to end. The cast-in-pairs cylinders have measurements $4\frac{1}{8}$ inches by $5\frac{1}{2}$ inches that give an over-all length of $41\frac{1}{2}$ inches, placed in a bonnet opening of $49\frac{1}{2}$ inches. The crankshaft has four bearings, the front one being ball and the others plain. It carries an 18-inch flywheel weighing 100 pounds and drives to a four-speed gearset. Oiling is by force feed. Ignition is by magneto and by battery with a wiring system notable for its excellence of detail and convenience in replacing exactly if dismounted. Coming through this to the right of the motor and about in a line with the cylinder heads, is a rectangular tube of vulcanite reaching nearly to the front of the motor heads. The top side is crowned slightly and has in it twelve plug holes, each about $\frac{1}{8}$ -inch in diameter, in three groups of four each. These are marked, commencing at the rear C6, M6, C5, M5; C4, M4, C3, M3; C2, M2, C1, M1; i. e., coil and magneto. Near the forward end are three plug holes on the front side and three on the back side. These are respectively marked 1, 3, 2 and 5, 4, 6. On the forward end is a plug hole for the return circuit. The result is very short wire lengths and no danger of incorrect timing if a number of wires are disconnected at one time.

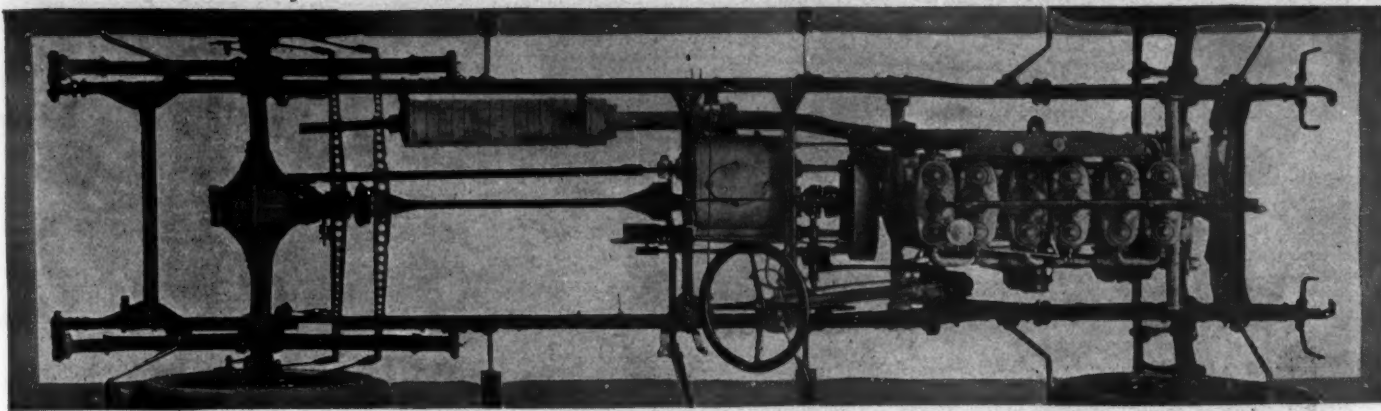
Both big and little Pierce sixes are timed to fire in sequence 1-5-3-6-2-4, this being the group that had two exponents in last week's show. The manifolds take that form where they branch right and left from the carbureter. Each branch has a T header



AS THE APPERSONS BUILD THEIR SIX



MOTOR USED IN THE PIERCE 40



DETAILS OF THE PIERCE CONSTRUCTION, AS SHOWN BY CHASSIS VIEW

with three exits to accommodate the cylinders cast in pairs. To give an equal gas flow the distances to all exits at the branches are enlarged at their end and have internal cross webs. Other similar conditions in the two sizes are the seven ball bearings to the crankshafts, ignition by magneto and battery, lubrication by gear pump from a well in the crankcase, and the power delivered through three speeds at the gearset. In the big six the cylinders are 5 inches bore by $5\frac{1}{2}$ inches stroke, giving a motor head measurement of $39\frac{1}{2}$ inches in a clear space, under the bonnet, of $46\frac{1}{2}$ inches. The flywheel measures 18 inches and weighs 50 pounds. The little six has cylinders $4\frac{1}{4}$ inches by $4\frac{3}{4}$ inches. The under-bonnet space is $42\frac{1}{2}$ inches, of which $34\frac{1}{2}$ inches is taken up by the cylinder heads. The flywheel weighs 35 pounds, with a diameter of $16\frac{3}{4}$ inches.

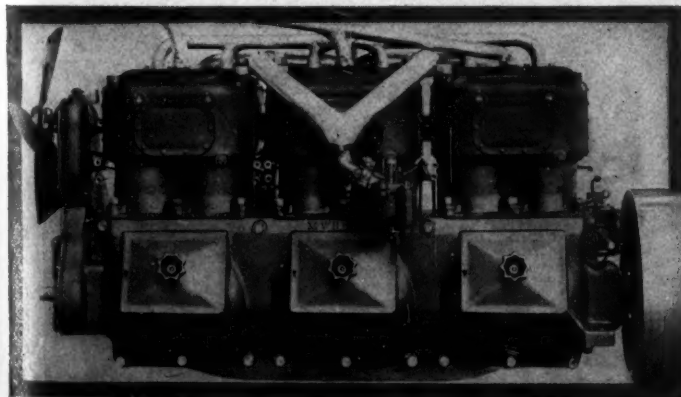
Coming again to the majority order of firing, one finds the Stevens-Duryea in the sequence 1-4-2-6-3-5, for both the big and little models. The manifold scheme used carries out that same distance-to-the-carburetor idea by using three T's. There is the main T with the ends of the head dropping to the cylinder ports and the four other ports reached by two short-stemmed T's, one to each branch of the main T, each short T being inverted. These mean that the cylinders are all cast separately. Other similar conditions in each model consist in four bearings along the crankshaft, force feed oiling and battery ignition, although the small six can be equipped with a magneto as an extra. They are both filled with a three-speed gear box, but the small car has plain bearings for the crankshaft, while the large has balls as the detail at this point. The obvious differences give the small car cylinders of $3\frac{3}{8}$ inches bore and $4\frac{3}{4}$ inches stroke, with their over-all measurement of $37\frac{1}{2}$ inches under a $45\frac{1}{2}$ -inch bonnet. The flywheel has a diameter of 19 inches and a weight of 69 pounds. In the larger car the cylinder bore and stroke is $4\frac{3}{4}$ inches by $5\frac{1}{4}$ inches. The bonnet measures 55 inches, of which the motor head measurement takes up $45\frac{1}{2}$ inches. The flywheel weighs 90 pounds, at 21 inches diameter.

That single line exponent of the six-cylinder car, the Winton, has a firing sequence of 1-5-3-6-2-4, which is one of the orders

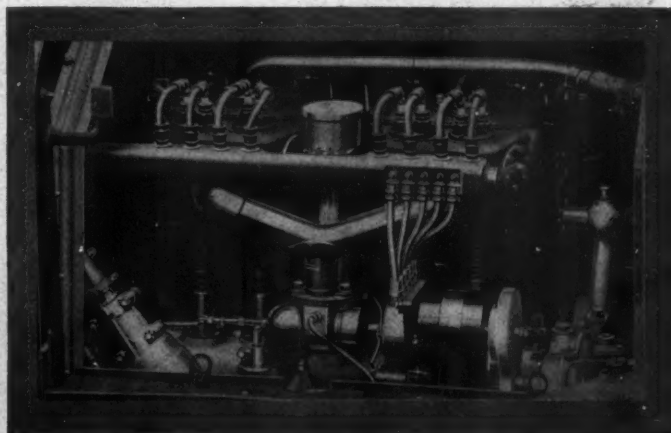
not used by many. The manifold joins with the majority design in that its lead from the carburetor is a two-way branch, as a Y, which is only a T after all, leading to a cross pipe having three exits, the cylinders being cast in pairs. The Y is very long branched, as the lead is across the cylinder, the carburetor being on the opposite side of the motor from the intake ports. The bore of the cylinders is $4\frac{1}{2}$ inches and the stroke 5 inches, the motor heads occupying a space of 36 inches in the bonnet clearance of 43 inches. The crankshaft runs on four plain bearings, carries a flywheel of 16 inches diameter and 75 pounds weight and delivers through a three-speed gearset. Oiling is by force feed. Ignition is by magneto and by battery, but with only one set of plugs.

With the order of firing 1-3-5-6-4-2, the Stearns joins the ranks of the next to the largest sequence order. Its manifold for the intake takes that greater used from that which divides, then subdivides the flow of gases to give an equal distance from the carburetor to the valve housing, the exits being three in number to the cast-in-pairs cylinders. The cylinders are $5\frac{3}{8}$ by $5\frac{3}{8}$ inches and have an over-all length of 45 inches, with a 7-inch clearance back of the radiator. The bonnet lid extends over the first four cylinders only, the back two cylinders being under a covering that flares slightly backward for something more than a foot to the dash, being in effect a hooded dash in reverse position. The crankshaft runs on four ball bearings and carries a 110-pound flywheel that is 20 inches in diameter, and is connected to a four-speed gearset. Ignition is by battery and magneto and oiling by force feed.

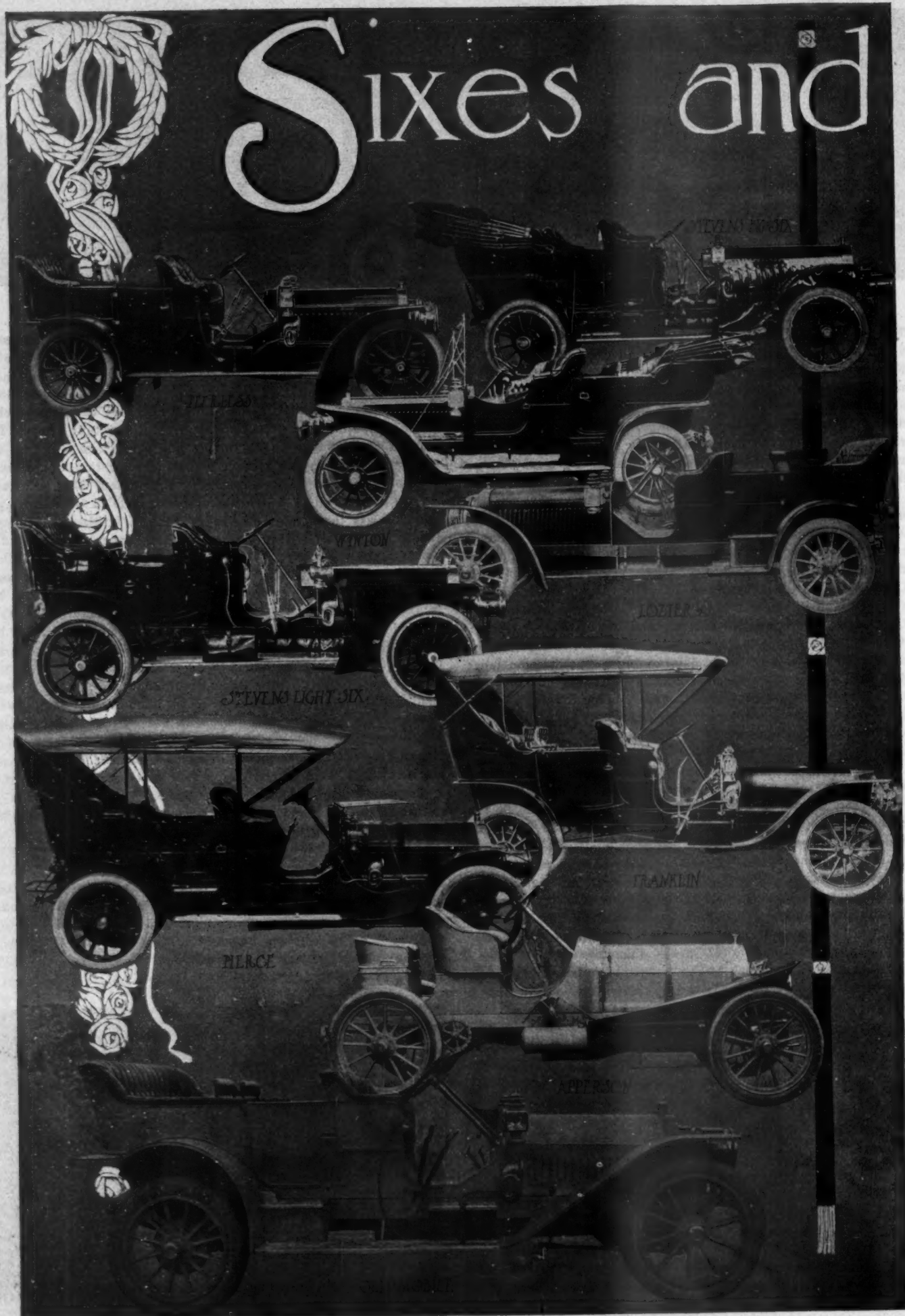
The Thomas also is an exponent of the sequence 1-3-5-6-4-2 as the order of firing. The intake manifold is in the form of a T, with its branches reaching into separate three exit heads, the cylinders being cast separately. These have a bore square with the stroke, the measurement being $5\frac{1}{2}$ inches, and occupy a space of 46 inches in a bonnet clearance of 52 inches. Plain bearings, seven in number, are used and the crankshaft finishes in a flywheel weighing 90 pounds, with a diameter of 18 inches.



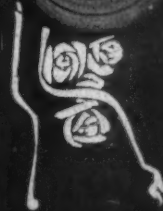
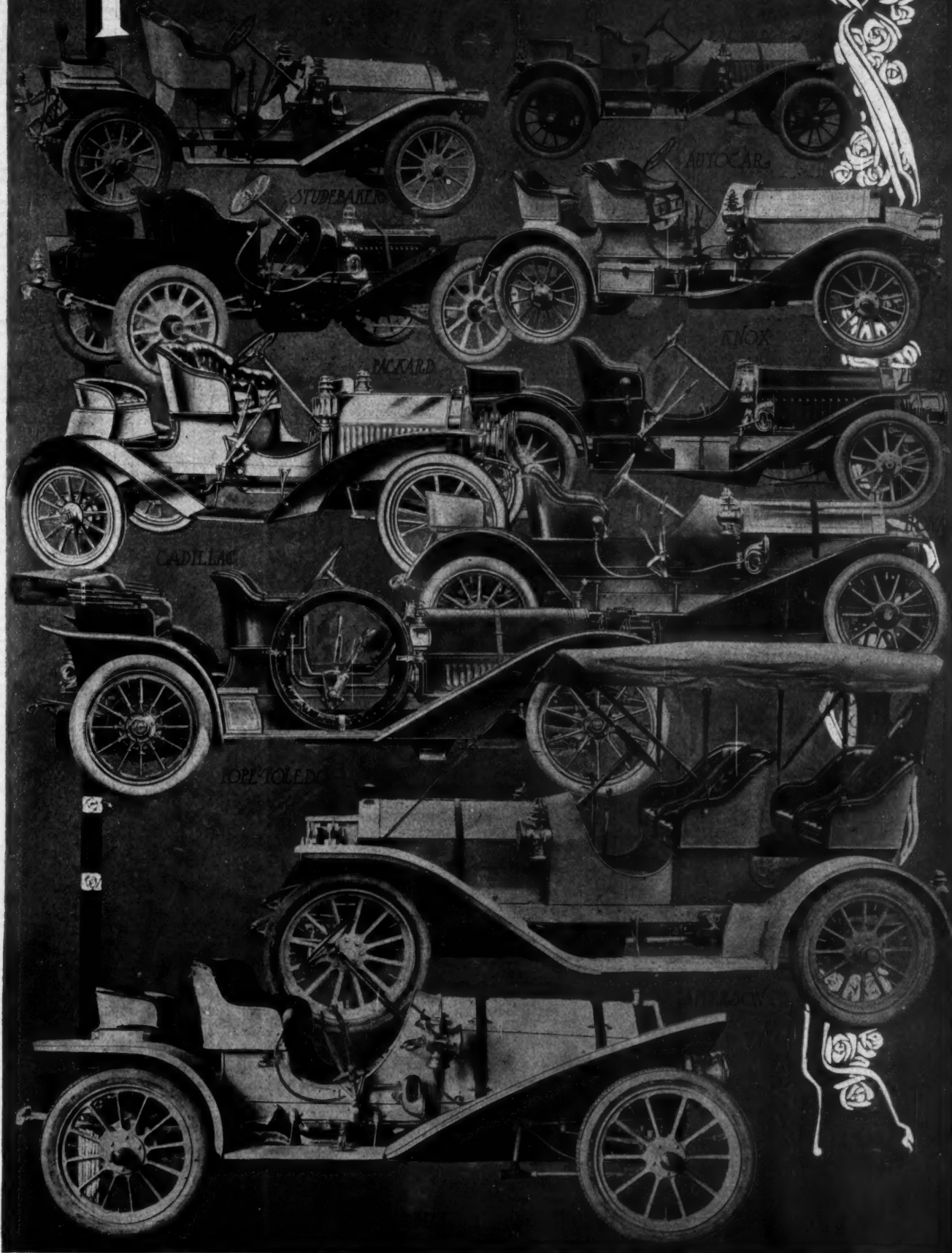
WINTON'S SIX-CYLINDER IDEA



THE WAY THE PEERLESS FOUR IS MADE



Tourabouts



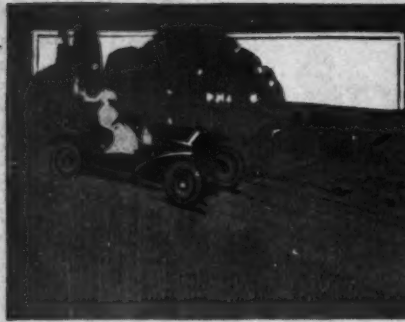
Specifications of Cars at the

Car	Maker	Price	Seating	H. P.	Cylinders	Bore and stroke	Valves
Apperson Jackrabbit	Apperson Bros. Automobile Co.	\$5,000	12	55	4	5 1/2 x 5	Mechanical
Apperson Model K	Apperson Bros. Automobile Co.	4,200	12	55	4	5 1/2 x 5	Mechanical
Apperson Model M Roadster	Apperson Bros. Automobile Co.	2,750	4	35	4	4 1/2 x 5	Mechanical
Apperson Model S	Apperson Bros. Automobile Co.	5,000	12	55	4	4 1/2 x 5	Opposite
Autocar Runabout	Autocar Co.	\$1,200	2	12	4	4 x 4	Mech. and auto
Autocar Touring	Autocar Co.	2,750	5	30	4	4 x 4	Mechanical
Babcock Roadster	Babcock Electric Carriage Co.	1,500	2	10	1	5 x 5	
Babcock Victoria	Babcock Electric Carriage Co.	1,700	2	10	1	5 x 5	
Baker Roadster	Baker Motor Vehicle Co.	2,500	5	40	4	4 1/2 x 5	
Baker Queen Victoria	Baker Motor Vehicle Co.	1,800	5	40	4	4 1/2 x 5	
Buick Model 5	Buick Motor Co.	2,500	5	24	4	4 1/2 x 4 1/2	
Buick Model 8	Buick Motor Co.	2,000	5	24	4	4 1/2 x 4 1/2	
Buick Model D	Buick Motor Co.	2,000	5	24	4	4 1/2 x 4 1/2	
Buick Model F	Buick Motor Co.	1,250	5	22	4	4 1/2 x 5	In heads
Buick Model G	Buick Motor Co.	1,150	5	22	4	4 1/2 x 5	In heads
Buick Model 10	Buick Motor Co.	850	3	18	4	3 1/2 x 3 1/2	
Cadillac Model S	Cadillac Motor Car Co.	850	2	10	1	5 x 5	In heads
Cadillac Model T	Cadillac Motor Car Co.	1,000	4	10	1	5 x 5	In heads
Cadillac Model T Coupe	Cadillac Motor Car Co.	1,350	2	10	1	5 x 5	In heads
Cadillac Model G Touring	Cadillac Motor Car Co.	2,000	5	25	4	4 1/2 x 4 1/2	In heads
Cadillac Model H Touring	Cadillac Motor Car Co.	2,500	5	30	4	4 1/2 x 5	In heads
Columbia Model 66-3	Electric Vehicle Co.	3,000	7	48	4	5 1/2 x 5 1/2	On one side
Columbia Model 48-2 Touring	Electric Vehicle Co.	4,000	4	29	4	4 1/2 x 4 1/2	On one side
Columbia 68 Brougham	Electric Vehicle Co.	4,000	2	12	1	5 x 5	
Columbia 69-2 Victoria Phaeton	Electric Vehicle Co.	1,800	2	12	1	5 x 5	
Columbia 68 Victoria	Electric Vehicle Co.	4,000	2	12	1	5 x 5	
Columbus Model 1000	Columbus Buggy Co.	2,500	2	12	1	5 x 5	
Corbin Model K	Corbin Motor Vehicle Corp.	2,500	5	30-35	4	4 1/2 x 4 1/2	On one side
Corbin Model S	Corbin Motor Vehicle Corp.	2,650	4	30-35	4	4 1/2 x 4 1/2	On one side
Elmore Model 40	Elmore Mfg. Co.	2,500	5	30-35	4	4 1/2 x 4	
Elmore Model 30 Touring	Elmore Mfg. Co.	1,750	5	24	3	4 1/2 x 4	
Franklin Model D Touring	H. H. Franklin Mfg. Co.	2,850	5	28	4	4 1/2 x 4	Mechanical
Franklin Model G Touring	H. H. Franklin Mfg. Co.	1,850	4	16	4	3 1/2 x 3 1/2	Mechanical
Franklin Model G Runabout	H. H. Franklin Mfg. Co.	1,750	2	16	4	3 1/2 x 3 1/2	Mechanical
Franklin Model H Touring	H. H. Franklin Mfg. Co.	4,000	7	42	6	4 1/2 x 4	Mechanical
General Roadster	General Vehicle Co.	2,500	5	30	4	4 1/2 x 5	Opposite
General Ladies' Phaeton	General Vehicle Co.	2,500	5	30	4	4 1/2 x 5	Opposite
Haynes Model S	Haynes Automobile Co.	3,000	5	45	4	4 1/2 x 5	Opposite
Haynes Model W	Haynes Automobile Co.	3,750	7	60	4	5 1/2 x 6	Opposite
Haynes Model U	Haynes Automobile Co.	4,000	7	35-40	4	4 1/2 x 5 1/2	In heads
Knox Model G	Knox Automobile Co.	2,600	4	25-30	4	4 1/2 x 4 1/2	In heads
Knox Model H	Knox Automobile Co.	2,700	5	30-6	4	4 1/2 x 4 1/2	In heads
Knox Model L	Knox Automobile Co.	4,750	7	40	4	5 x 6	Opposite
Locomobile Model I	Locomobile Co. of America	4,750	3	40	4	5 x 6	Opposite
Locomobile Model I Runabout	Locomobile Co. of America	2,900	3	20	4	3 1/2 x 4 1/2	Opposite
Locomobile Model E Runabout	Locomobile Co. of America	2,900	5	20	4	3 1/2 x 4 1/2	Opposite
Locomobile Model E Standard	Locomobile Co. of America	5,000	7	45	4	5 1/2 x 6	Opposite
Lozier Model H	Lozier Motor Co.	6,000	7	50	6	4 1/2 x 5 1/2	Opposite
Lozier Model I	Lozier Motor Co.	5,500	7	50	4	5 x 6	In heads
Matheson	Palmer & Singer Mfg. Co.	1,800	5	24	2	5 1/2 x 5 1/2	
Northern Model C	Northern Motor Car Co.	2,750	5	40-45	4	4 1/2 x 4 1/2	On one side
Northern Model L	Northern Motor Car Co.	2,750	5	40-45	4	4 1/2 x 4 1/2	On one side
Oldsmobile Model M	Olds Motor Works	1,900	5	35-40	4	4 1/2 x 4 1/2	Opposite
Oldsmobile Model MR	Olds Motor Works	4,200	7	30	4	5 x 5 1/2	Opposite
Oldsmobile Model X	Olds Motor Works	4,200	7	30	4	5 x 5 1/2	Opposite
Packard Model 30 Runabout	Packard Motor Car Co.	6,500	7	60	6	5 x 5 1/2	Opposite
Pierce Great Arrow	Geo. N. Pierce Co.	5,500	7	40	6	4 1/2 x 4 1/2	Opposite
Pierce Great Arrow	Geo. N. Pierce Co.	5,000	7	40	4	5 x 5 1/2	Opposite
Pierce Great Arrow	Geo. N. Pierce Co.	2,750	4	30	4	4 1/2 x 5 1/2	In heads
Pope-Hartford Model M Touring	Pope Mfg. Co.	2,500	5	30	4	4 1/2 x 5 1/2	In heads
Pope-Hartford Model R Touring	Pope Mfg. Co.	3,100	7	30	4	4 1/2 x 5 1/2	In heads
Pope-Hartford Model NI Touring	Pope Mfg. Co.	1,750	4	20	4	4 x 4	In heads
Pope-Tribune Model X Touring	Pope Motor Car Co.	4,250	7	50	4	4 1/2 x 5 1/2	In heads
Pope-Toledo Model 16	Pope Motor Car Co.	4,750	7	50	4	4 1/2 x 5 1/2	In heads
Pope-Toledo Model 17 Touring	Pope Motor Car Co.	4,750	7	50	4	4 1/2 x 5 1/2	In heads
Pope-Toledo Model 18 Touring	Pope Motor Car Co.	7,000	7	50	4	4 1/2 x 5 1/2	In heads
Pope-Toledo Model 20 Touring Coach	Pope Motor Car Co.	4,300	7	30	4	4 1/2 x 5 1/2	In heads
Peerless Model 18 Touring	Peerless Motor Car Co.	6,000	7	60	6	4 1/2 x 5 1/2	In heads
Peerless Model 20 Roadster	Peerless Motor Car Co.	6,000	3	60	6	4 1/2 x 5 1/2	In heads
Rauch & Lang Landaulet	Rauch & Lang Carriage Co.	4,200	8	45	4	5 1/2 x 5 1/2	Cast in pairs
Rauch & Lang Stanhope	Rauch & Lang Carriage Co.	1,850	2	10	1	5 x 5	
Royal Tourist Model G III	Royal Motor Car Co.	4,000	7	45	4	5 1/2 x 5 1/2	Both sides
Selden Model 45	Selden Motor Vehicle Co.	5,500	7	45-60	4	5 1/2 x 5 1/2	On one side
Selden Model 25	Selden Motor Vehicle Co.	2,000	5	25-28	4	4 1/2 x 4 1/2	On one side
Stevens-Duryea Model X	Stevens-Duryea Co.	2,750	5	24	4	4 1/2 x 4 1/2	On one side
Stevens-Duryea Model R	Stevens-Duryea Co.	2,500	5	20	4	3 1/2 x 4 1/2	On one side
Stevens-Duryea Model U	Stevens-Duryea Co.	3,500	5	35	6	3 1/2 x 4 1/2	On one side
Stevens-Duryea Model S	Stevens-Duryea Co.	6,000	7	50	6	4 1/2 x 5 1/2	On one side
Stearns Touring	F. B. Stearns Co.	4,600	5	30	4	5 x 5 1/2	On right side
Stearns Touring	F. B. Stearns Co.	4,600	4	30	4	5 x 5 1/2	On right side
Stearns Touring	F. B. Stearns Co.	6,250	4	45	6	5 1/2 x 5 1/2	On right side
Sampson Road Train	Alden Sampson Mfg. Co.	1,150	2	10	1	5 x 5	Opposite
Studebaker Model H	Studebaker Automobile Co.	3,600	5	30	4	4 1/2 x 5 1/2	Mechanical
Studebaker Model A Touring	Studebaker Automobile Co.	3,500	5	30	4	4 1/2 x 5 1/2	Mechanical
Studebaker Model B Touring	Studebaker Automobile Co.	4,000	7	40	4	4 1/2 x 5 1/2	Mechanical
Studebaker Model 22-A Runabout	Studebaker Automobile Co.	1,350	2	10	1	5 x 5	
Thomas Model 4-60	E. R. Thomas Motor Car Co.	4,500	7	60	4	5 1/2 x 5 1/2	Opposite
Thomas Speedway Flyer	E. R. Thomas Motor Car Co.	4,500	7	60	4	5 1/2 x 5 1/2	Opposite
Thomas Tourabout	E. R. Thomas Motor Car Co.	4,500	7	60	4	5 1/2 x 5 1/2	Opposite
Thomas Town Car	E. R. Thomas Motor Car Co.	3,000	5	16-20	4	3 1/2 x 4 5/16	On one side
Thomas Taximeter Cab	E. R. Thomas Motor Car Co.	2,500	5	16-20	4	3 1/2 x 4 5/16	On one side
Thomas-Detroit Model D Touring	E. R. Thomas-Detroit Co.	2,750	5	40	4	5 x 4 1/2	On one side
White Steamer Model L Touring	White Co.	2,500	5	20	2	3 1/2 x 4 5/16	On one side
White Steamer Model L Runabout	White Co.	2,400	3	20	2	3 1/2 x 4 5/16	On one side
Walter Touring	Walter Automobile Co.	5,000	7	40	4	5 x 5 1/2	On one side
Walter Limousine	Walter Automobile Co.	5,000	7	40	4	5 x 5 1/2	On one side
Waltham Model 18	Waltham Automobile Co.	400	2	10	1	3 1/2 x 4 1/2	Automatic
Waltham Model 28	Waltham Automobile Co.	600	2	10	1	3 1/2 x 4 1/2	Mechanical
Waltham Model DLR	Waltham Automobile Co.	750	2	10	1	3 1/2 x 4 1/2	Mechanical
Waltham Model 138	Waltham Automobile Co.	1,200	2	10	1	3 1/2 x 4 1/2	Mechanical
Winton Six-Teen-Six	Winton Motor Carriage Co.	4,500	7	48-6	6	4 1/2 x 5	On one side

* Two-cycle † Tons

Eighth Annual A.L.A.M. Show

Clutch	Speed change	Drive	Cooling	Ignition	Lubricating	Wheel base	Springs	Tires
Band	Selective	Double chain	Water	Mag. and bat.	Mechanical	105 1/2	Semi-elliptic	34 x 3 1/2 and 34 x 4
Band	Selective	Double chain	Water	Mag. and bat.	Mechanical	114	Semi-elliptic	36 x 4 and 36 x 4 1/2
Band	Selective	Shaft	Water	Mag. and bat.	Mechanical	106 1/2	Semi-elliptic	34 x 4
Band	Selective	Double chain	Water	Mag. and bat.	Mechanical	108	Semi-elliptic	34 x 4
Floating ring	Sliding	Shaft	Water	Jump spk., storage	Force feed	80	S. E. front, F. E. rear	30 x 3
Floating ring	Sliding	Shaft	Water	Jump spk., storage	Force feed	112	Semi-elliptic	34 x 4
		Double chain	Water			78		32 x 3 1/2
		Double chain	Water			78		32 x 3 1/2
		Shaft				95	Semi-elliptic	34 x 4
Cone	Selective	Shaft	Water	Jump spark	Gear pump	70	S. E. front, F. E. rear	30 x 3 1/2
Multiple disk	Selective	Shaft	Water	Jump spark	Mech. force feed	108	Semi-elliptic	34 x 4
Multiple disk	Selective	Shaft	Water	Jump spark	Mech. force feed	106	Semi-elliptic	32 x 4
Cone	Planetary	Chain	Water	Jump spark	Mech. force feed	102 1/2	S. E. front, F. E. rear	32 x 4
Cone	Planetary	Chain	Water	Jump spark	Mech. force feed	90	S. E. front, F. E. rear	30 x 3 1/2
Cone	Planetary	Shaft	Water	Jump spark	Force feed	88	S. E. front, F. E. rear	30 x 3
Flat disk	Planetary	Chain	Water	Jump spark	Force feed	82	Semi-elliptic	30 x 3
Flat disk	Planetary	Chain	Water	Jump spark	Force feed	82	Semi-elliptic	30 x 3 1/2
Flat disk	Planetary	Chain	Water	Jump spark	Force feed	82	Semi-elliptic	30 x 3 1/2
Cone	Selective	Shaft	Water	Jump spark	Splash	100	S. E. front, F. E. rear	32 x 3 1/2
Dbl. flat disk	Planetary	Shaft	Water	Jump spark	Splash	102	S. E. front, F. E. rear	34 x 4
Electric	Electric	Shaft	Water	Mag. and bat.	Mechanical	120	Semi-elliptic	36 x 4 and 36 x 5
Cone	Selective	Shaft	Water	Magneto	Force feed	100	Semi-elliptic	32 x 3 1/2 and 32 x 4
		Dbl. reduction					S. E. fr., 1/2 plat. rear	815x105 & 820x120 mm.
		Chain					Semi-elliptic	30 x 3 1/2
		Dbl. reduction					S. E. fr., 1/2 plat. rear	815x105 & 820x120 mm.
Cone	Selective	Shaft	Water	Jump spark bat.	Mechanical	69	F. E. rear, H. plat. front	30 x 3 1/2 and 31 x 4
Cone	Selective	Shaft	Water	Jump spark bat.	Mechanical	110	Semi-elliptic	34 x 3 1/2 and 34 x 4
Int. exp.	Selective	Shaft	Water	Atwater-Kent	Mechanical	110	S. E. front, plat. rear	34 x 4
Int. exp.	Selective	Shaft	Water	Atwater-Kent	Mechanical	104	S. E. front, plat. rear	32 x 3 1/2
Disk	Selective	Bevel gear	Air	Jump spark	Splash	105	Full elliptic	34 x 3 1/2 and 34 x 4
Disk	Selective	Bevel gear	Air	Jump spark	Splash	90	Full elliptic	30 x 3 and 30 x 3 1/2
Disk	Selective	Bevel gear	Air	Jump spark	Splash	90	Full elliptic	30 x 3 and 30 x 3 1/2
Disk	Selective	Bevel gear	Air	Jump spark	Splash	127	Full elliptic	36 x 4 and 36 x 4 1/2
		Chain					Semi-elliptic	30 x 3 1/2
		Double chain				72	Semi-elliptic	30 x 3 1/2
Constr. band	Selective	Shaft	Water	Battery	Mechanical	102	S. E. front, F. E. rear	32 x 4
Constr. band	Selective	Shaft	Water	Mag. and bat.	Mechanical	106	Semi-elliptic	34 x 4
Constr. band	Selective	Shaft	Water	Mag. and bat.	Mechanical	118	Semi-elliptic	36 x 4 1/2
Cone	Selective	Double chain	Air	Jump spk. and mag.	Force feed	112	Semi-elliptic	34 x 4 and 34 x 4 1/2
Cone	Selective	Bevel gear	Air	Jump spk., dry cells	Force feed	102	Semi-elliptic	32 x 4
Cone	Selective	Dbl. side chns.	Water	Make and break	Force feed	102	Semi-elliptic	32 x 4
Cone	Selective	Dbl. side chns.	Water	Make and break	Mechanical	123	Semi-elliptic	36 x 4 and 36 x 4 1/2
Cone	Selective	Dbl. side chns.	Water	Make and break	Mechanical	123	Semi-elliptic	36 x 4 and 36 x 4 1/2
Cone	Selective	Dbl. side chns.	Water	Make and break	Mechanical	106	Semi-elliptic	32 x 4
Cone	Selective	Dbl. side chns.	Water	Make and break	Mechanical	102	Semi-elliptic	32 x 4
Multiple disk	Sliding	Cardon	Air	Mag. and storage	Force feed	124	Platform rear	36 x 4 and 36 x 4 1/2
Multiple disk	Sliding	Cardon	Water	Mag. and storage	Force feed	131	Platform rear	36 x 4 and 36 x 4 1/2
Disk	Selective	Chain	Water	Make and break	Mech. force feed	128	Semi-elliptic	36 x 4 and 36 x 5
Expanding metal	Planetary	Shaft	Water	Jump spark	Force feed	106	Full elliptic	32 x 3 1/2
Cone	Sliding	Shaft	Water	J. S. mag. storage	Pump	119	S. E. front, plat. rear	34 x 4 1/2
Cone	Selective	Shaft	Water	Jump spark	Olds Motor Wks.	112	S. E. front, F. E. rear	34 x 3 1/2 and 34 x 4
Cone	Selective	Shaft	Water	Jump spark	Olds Motor Wks.	106	Semi-elliptic	34 x 3 1/2 and 34 x 4
Cone	Selective	Shaft	Water	Jump spark	Olds Motor Wks.	106	Semi-elliptic	32 x 3 1/2
Int. exp.	Progressive	Shaft	Water	J. S. mag. bat.	Splash and force	123 1/2	Semi-elliptic	36 x 4 and 36 x 4 1/2
Int. exp.	Progressive	Shaft	Water	J. S. mag. bat.	Splash and force	108	Semi-elliptic	36 x 3 1/2 and 36 x 4
Cone	Progressive	Shaft	Water	Mag. and bat.	Pierce	135	Semi-elliptic	36 x 4 1/2 and 36 x 5
Cone	Progressive	Shaft	Water	J. S. mag. bat.	Pierce	130	Semi-elliptic	36 x 4 and 36 x 5
Cone	Progressive	Shaft	Water	J. S. mag. bat.	Pierce	124	Semi-elliptic	36 x 4 and 36 x 5
Cone	Selective	Shaft	Water	Make and break	Pressure	112	Semi-elliptic	34 x 3 1/2 and 34 x 4
Cone	Progressive	Shaft	Water	Make and break mag.	Pressure	102	Semi-elliptic	32 x 4
Cone	Progressive	Shaft	Water	Make and break mag.	Pressure	102	Semi-elliptic	32 x 4
Cone	Progressive	Shaft	Water	Make and break	Mechanical	88	Semi-elliptic	32 x 3 1/2
Multiple disk	Selective	Double chain	Water	Jump spk. and bat.	Splash	115	Semi-elliptic	36 x 3 1/2 and 36 x 4 1/2
Multiple disk	Selective	Double chain	Water	Jump spk. and bat.	Splash	125	Semi-elliptic	36 x 4 and 36 x 4 1/2
Multiple disk	Selective	Double chain	Water	Mag. and bat.	Splash	115	Semi-elliptic	36 x 4 and 36 x 4 1/2
Multiple disk	Selective	Double chain	Water	Jump spk. mag. bat.	Splash	125	Semi-elliptic	36 x 4 and 36 x 5
Int. exp. band	Selective	Shaft	Water	Mag. and bat.	Mechanical	118 1/2	Flat silico.	36 x 4 and 36 x 4 1/2
Int. exp.	Selective	Shaft	Water	Mag. and bat.	Mechanical	134	Flat silico.	36 x 4 and 36 x 5
Int. exp.	Selective	Shaft	Water	Mag. and bat.	Mechanical	123	Flat silico.	36 x 4 and 36 x 5
		Double chain				115	Semi-elliptic	34 x 4 1/2
Cont. and exp.	Sliding	Double chain	Water	Jump spark		74	S. E. front, F. E. rear	32 x 3 1/2
Multiple disk	Selective	Shaft	Water	H. T. mag. and bat.	Force feed	114	Platform	36 x 4 1/2 and 36 x 5
Cone	Selective	Shaft	Water	H. T. mag. and bat.	Force feed	109		32 x 3 1/2
Multiple disk	Sliding	Bevel gear	Water	Jump spark	Force feed	124	Semi-elliptic	34 x 4
Multiple disk	Sliding	Bevel gear	Water	Jump spark	Force feed	90	Semi-elliptic	30 x 3 1/2
Multiple disk	Sliding	Bevel gear	Water	Jump spark	Force feed	114	Semi-elliptic	34 x 4
Multiple disk	Sliding	Bevel gear	Water	Jump spark	Force feed	122	Semi-elliptic	36 x 4 and 36 x 5
Int. exp.	Selective	Double chain	Water	Jump spark	Force feed	120	Semi-elliptic	36 x 3 1/2 and 36 x 4 1/2
Int. exp.	Selective	Double chain	Water	Jump spark	Force feed	120	Semi-elliptic	36 x 3 1/2 and 36 x 4
Int. exp.	Selective	Double chain	Water	Jump spark	Force feed	128	Semi-elliptic	36 x 4 and 36 x 5
		Back gear & ch.	Water	Jump spark	Force feed	144	Semi-elliptic	54 x 5 and 42 x 3 1/2
Cone	Progressive	Shaft	Water	Make and break mag.	Mechanical	104	Semi-elliptic	34 x 4
Cone	Progressive	Shaft	Water	Make and break mag.	Mechanical	104	S. E. fr., 1/2 plat. rear	34 x 4
Cone	Selective	Shaft	Water	Make and break mag.	Mechanical	114	S. E. fr., 1/2 plat. rear	34 x 4 1/2
		Single chain				67	S. E. front, F. E. rear	30 x 3 and 30 x 3 1/2
Thomas disk	Selective	Double chain	Water	Atwater-Kent & mag.	Mechanical	127	Semi-elliptic	36 x 4 1/2 and 36 x 5
Thomas disk	Selective	Double chain	Water	Atwater-Kent & mag.	Mechanical	127	Semi-elliptic	36 x 4 1/2 and 36 x 5
Thomas disk	Selective	Double chain	Water	Atwater-Kent & mag.	Mechanical	127	Semi-elliptic	36 x 4 1/2 and 36 x 5
Thomas disk	Selective	Shaft	Water	Mag. and bat.	Mechanical	103	S. E. front, F. E. rear	34 x 4
Thomas disk	Selective	Shaft	Water	Mag. and bat.	Mechanical	103	S. E. front, F. E. rear	32 x 4
		Shaft				112 1/2	Semi-elliptic	34 x 4
		Shaft				104	Semi-elliptic	34 x 4
Cone or disk	Selective	Bevel gear	Water	H. T. mag. and bat.	Mechanical	120	Semi-elliptic	36 x 4 and 36 x 5
Cone or disk	Selective	Bevel gear	Water	H. T. mag. and bat.	Mechanical	120	Semi-elliptic	36 x 4 and 36 x 5
Cone	Friction	Double chain	Air	Jump spark	Splash	84	Full elliptic	26 x 2 1/2
Cone	Friction	Double chain	Air	Jump spark	Splash	84	Full elliptic	26 x 2 1/2
Cone	Sliding	Bevel gear	Air	Jump spark	Splash	96	Semi-elliptic	32 x 3 1/2
Multiple disk	Friction	Double chain	Water	Jump spark	Splash	92	S. E. front, F. E. rear	30 x 3
	Selective	Shaft	Water	Mag. and accum.	Mechanical	120	Winton twin	36 x 4 1/2



Improvements in the 1908 Cars

THE WILDER

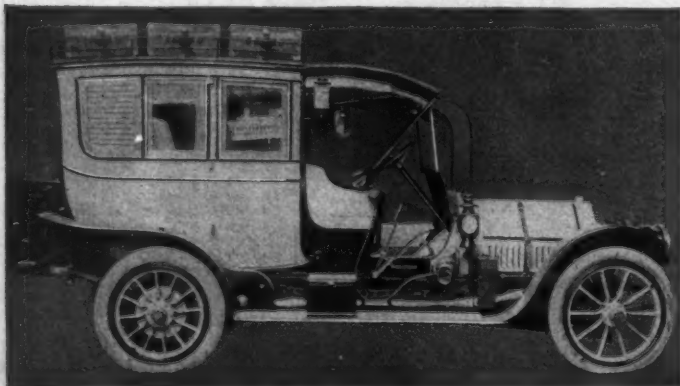
THE show sensation is the \$850 Buick four-cylinder runabout.

For an extra \$50 it can be had with the rumble seat. Every visitor at the show stops to carefully examine this new model as well as the other entirely new high-powered four-cylinder car on exhibition. The little Buick in brief has a four-cylinder 18-horsepower motor, with $3\frac{3}{4}$ -inch bore and stroke cylinders, which are cast in pairs and have intake and exhaust valves carried in the cylinder heads and opened by rocker arm from one camshaft, there being one rocker arm for each valve. From the motor transmission is through a two-speed planetary set and shaft to the live rear axle. The wheelbase is 88 inches, tires 30 by 3 inches, the rear axle has Hyatt roller bearings and the front road wheels Timken bearings. Looking at the motor are seen the Kingston carbureter, dry-cell current production, with single unit coil and distributor parts, Hill mechanical lubricator and conventional positive water-cooling. The valve cages set into the cylinder heads, being retained there by two studs. Intake and exhaust manifolds are placed on the same side, the intake a T rising from the carbureter and the exhaust a two-piece manifold placed above the level of the valves with a telescopic union between the parts of it for the cylinder casting to care for the expansion. Half-time gears at the forward end are well housed and run in oil and X yokes secure the valve lifter rods guides into the top of the crankcase. Valve timing is through adjustments on the lifter rods. The distributor is on the top of a short vertical shaft at the rear of the fourth cylinder. In the planetary gearset, with two forward speeds, the high-speed clutch is a leather-faced cone and the slow speed and reverse bands are lined with camel's hair. The high speed control is by side lever and the slow speed and reverse by pedals. Steering is through an irreversible gear and the motor and transmission are carried on a subframe. The driveshaft to the back axle is enclosed, and assisting in taking the driving strain off the shaft are side radius rods extending from the axle housing to the frame side pieces. This runabout is officially known as No. 10. The other new Buick is model No. 5, which has a four-cylinder motor with cylinders in pairs, opposite valves, Remy magneto and battery ignition, and a crankcase system of oiling in which oil is raised by a gear pump from a basement part of the crankcase and delivered to a tank from which it feeds by gravity to the motor parts, passing en route through sights on the dash. The car has cone clutch, Brown-Lipe selective transmis-

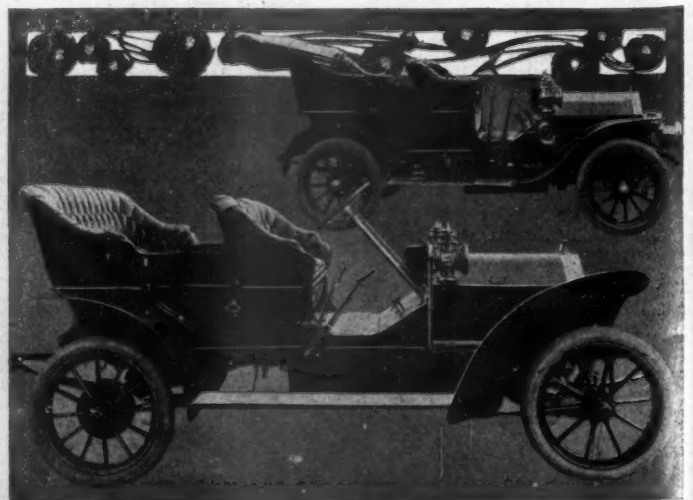
sion, shaft drive and will be furnished with semi-elliptic springs all around, although shown with scroll-style elliptics. It has three brakes, two expanding on the rear wheels, and a clamping brake on the transmission shaft in the rear of the gearset. The model D 1907 four-cylinder car is continued without changes. The model F, with a two-cylinder motor placed under the body, has by way of improvements a new design of straight-line body, a large bonnet much as that on the four-cylinder cars, a redesigned radiator, full-elliptic rear springs—there were semi-elliptics—and larger brakes; also spark and throttle control over the steering wheel, together with the tilting steering wheel. The model S tourabout car is made with bodies for two, three or four passengers, as the purchaser may decide.

Pope-Toledo Shows Improvements in Detail

In the 50-horsepower Pope-Toledo are over three score improvements in detail, all of which have been made without altering the general plan of the car in which is retained a copper-waterjacketed motor, disk clutch, selective gearset and side chain-drive. Motor improvements include the casting the lower part of the crankcase in two parts, the basement part constituting an oil reservoir from which a pump draws the oil and delivers it into the two troughs in the upper portion where it forms a splash, the overflow escaping by standpipes and returning to the basement; casting cupped flanges on the inside of the piston near the bottom for catching the splash and providing oilways from this cupped flange to the outer piston walls; mounting the fan on a bracket supported on the half-time gear housing and driving it by flat belt; using individual exhaust valve springs; increasing the waterjacket capacity for each cylinder head to the extent of 2 pints; making the intake valves with an auxiliary stem which rests on top of the regular stem and passes through the valve cage cap so in case of the cage warping the strain is prevented from influencing the stem; casting the crankcase with webs between the supporting arms; adding a dual ignition scheme combining gear-driven magneto and storage cells; adding a timer on the top of a vertical shaft at the right between the cylinder pairs; improving the carbureter

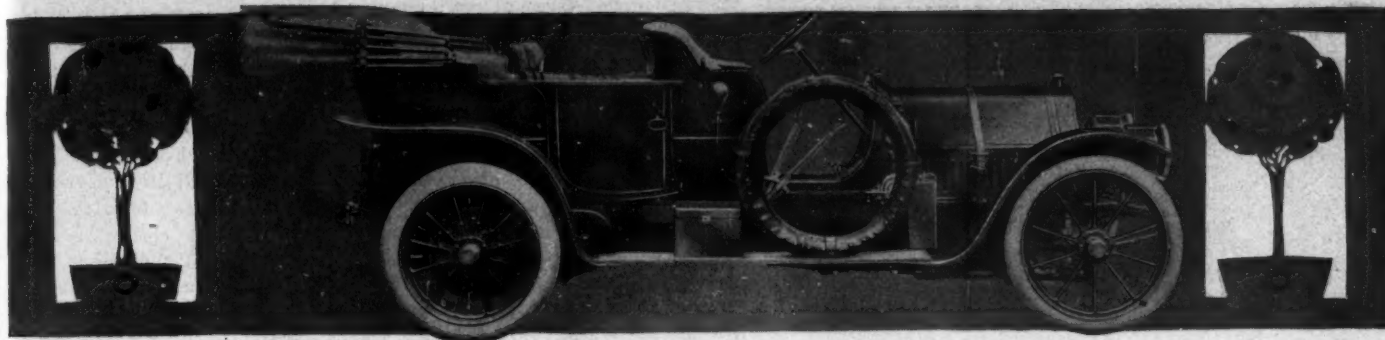


UNIQUE BODY ON A POPE-TOLEDO



OLDSMOBILE FOUR

KNOX TOURING CAR



POPE-TOLEDO TOURING CAR WITH STRAIGHT LINE BODY

by placing the sliding barrel throttle in a vertical position above the spraying nozzle; inserting a telescopic union in the exhaust manifold between the twin cylinder castings; and increasing such parts as rocker arms for opening valves, rocker arm fulcrum bolts, valve lifter rod guides, lifter rod rollers, and cams and grease cups on the valve rocker arms. Fifty pounds have been taken out of the disk clutch by reducing the disks to thirty-three and perforating the disk carriers. Between the clutchcase and the gearcase is a large packing gland. Jackshaft sprockets are now cup-shaped steel hubs, to which are bolted ring sprockets; the forward ends of the radius rods have a ball-and-socket attachment at the forward ends on the expanded end of the jackshaft housing as well as a new design of turnbuckle. Drive chains are enclosed in casings formed with an aluminum framework supported on the radius rods and carrying a leather cover; plate-topped spring clips are in use; the gasoline tank is a rectangular member located in the rear under the chassis frame; on the dash is a very small running gasoline tank filled from the main tank by a diaphragm pump operated from the exhaust, the tank having an automatic float-regulated shut-off valve; extending under the body is a patented mud apron with special doors in it for furnishing access to the under parts of the chassis—to the grease cups and adjusting screws or nuts. Brakes are expanded within the rear wheel drums whereas the second is a clamping band on the transmission shaft. The car has a straight line body with luggage space under the front and tonneau seats and tools carried on the running boards. The three or four-passenger roadster is one of the handsome turnouts of the show. Besides the touring car and roadster embracing all of these alterations, the company has a model 16 which is a continuation of the 1907 car except it has the new crankcase design and fan support.

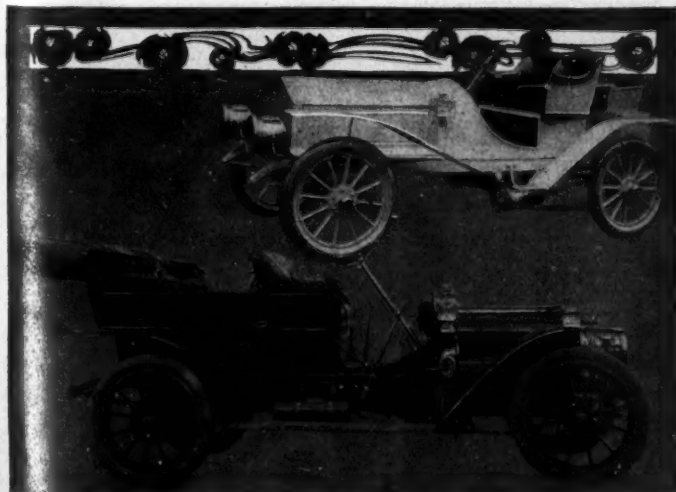
Selden Makes Its Bow at the Show

The only new gasoline face at the show is the Selden, bearing the name of the creator of the license association. The Selden is in two models, a 28-horsepower car fitted with a Continental

motor, Warner selective transmission and shaft drive. The motor and transmission are carried on a dropped subframe, side pieces of the mainframe are straight from front to rear and supporting it is a set of four semi-elliptic springs. The big car, and the only one disclosing the real Selden features, is a 50-horsepower machine with a four-cylinder motor having cylinders cast in pairs with opposite integral valve chambers and direct-lift valves. Ball bearings of the Hess-Bright make carry the motor crank and camshafts and support such other car parts as transmission shafts, rear axle shafts and the front wheels. Water plates close the tops of the waterjackets on the cylinder pairs, the webbed crankcase offers good support for the motor appurtenances, a Lunkenheimer oiler forces lubricant to the motor parts and a gear water pump insures cooling circulation. On the right side and opposite the oiler and water pump are the magneto and carbureter. The car includes in its chassis outlay flywheel cone clutch, four-speed selective gearset with direct drive on the fourth speed and shaft drive.

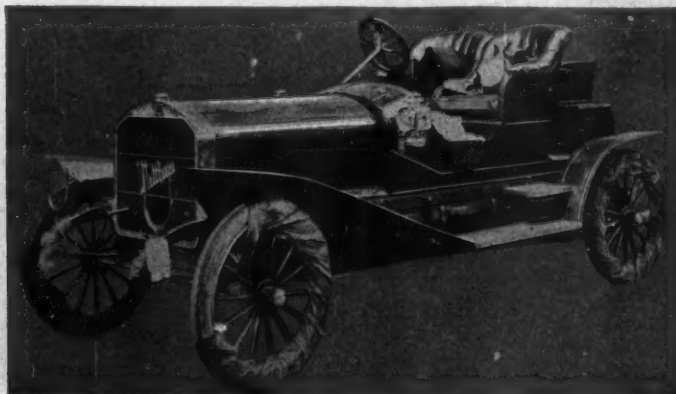
Walter Has Town Cabs and Touring Cars

Besides being one of the two makers at the show to display a town cab the Walter company exhibits two styles of touring cars which show many changes of a slight but noticeable character. The engines are in 20 and 40-horsepower sizes, the former for the town cab. In previous 40-horsepower Walter cars the intake valves were placed centrally in the cylinder heads, but now they are disposed in the floors of integral ports on the motor side opposite to the exhaust valves. On the front right face of the dash hangs a horizontal plunger oil pump which forces its supply through dash sights and thence to the motor parts. A three-point motor support cannot be overlooked in which the forward end has a single support of a horseshoe metal piece which at its center trunnions onto the center of a cross piece of the mainframe. The rear of the crankcase has right and left integral support arms for connecting with the side members of the frame. Two ignition systems furnish the electric current, one an Eisemann magneto with single-unit Carpentier coil and the other set a storage cell which is high tensioned through the same coil and distributed by the magneto distributor. The G and A carbureter, a French design with mixing chamber in the form of a venturi tube and the auxil-

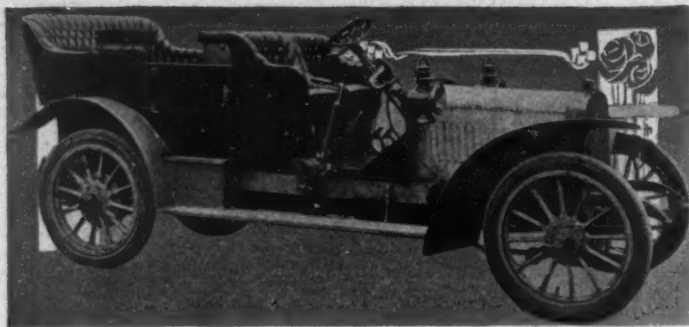


KNOX WATER-COOLER

R & L ELECTRIC RUNABOUT



WALTHAM ROADSTER JUST ARRIVED



ONE OF THE NEW CROP OF LOZIER

ary air valve comprising a series of balls resting in and closing air openings into the mixing chamber, hangs to the intake manifold. Expanding brakes on the rear wheels have steel and bronze as the contact members and the clamping propeller snail brake is of increased drum diameter and width. The frame shows an added cross member in front of the transmission. The flywheel diameter is greater than heretofore. In place of a French right and left hand nut steering gear, a single-piece torsion bar is used. The town cab, with its four-cylinder motor with 4 and 4½-inch bore and stroke, has cylinders in pairs, with valves in the heads and having the rocker arms and overhead camshaft completely closed and operating in oil. It has the G and A carburetor, magneto and battery ignition and plunger pump oiler. The body is unique in that it is of the complete folding landaulet type, so designed that with the top down there is no projecting parts above the driver's seat, no standing door frame work but a simple open touring car body.

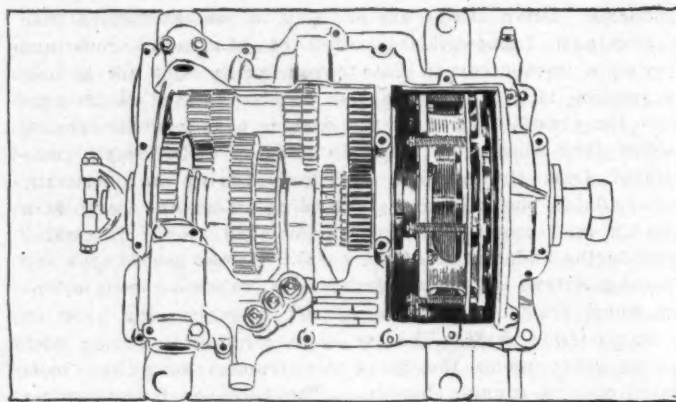
Pierce Has Two Fours and Two Sixes

Two fours and two sixes is the 1908 Pierce line. The new member is the little six, which made its debut on the Glidden and which introduces little new in Pierce design. In the four-cylinder cars few changes have been made, the cars, other than a few body appointments, remaining as during the 1907 season. The sixes embrace regular Pierce design, with the extra cylinders, separately cast and with opposite valves. Magneto and battery ignitions are standard. The gear pump and gravity flow motor lubrication system remains, as does motor support through bronze cross arms. The cars embrace the many features that have made them distinctive for several seasons and among which might be mentioned progressive sliding transmission, with the shift lever on the steering column beneath the hand wheel.

Two of the Three Peerless Models Are New

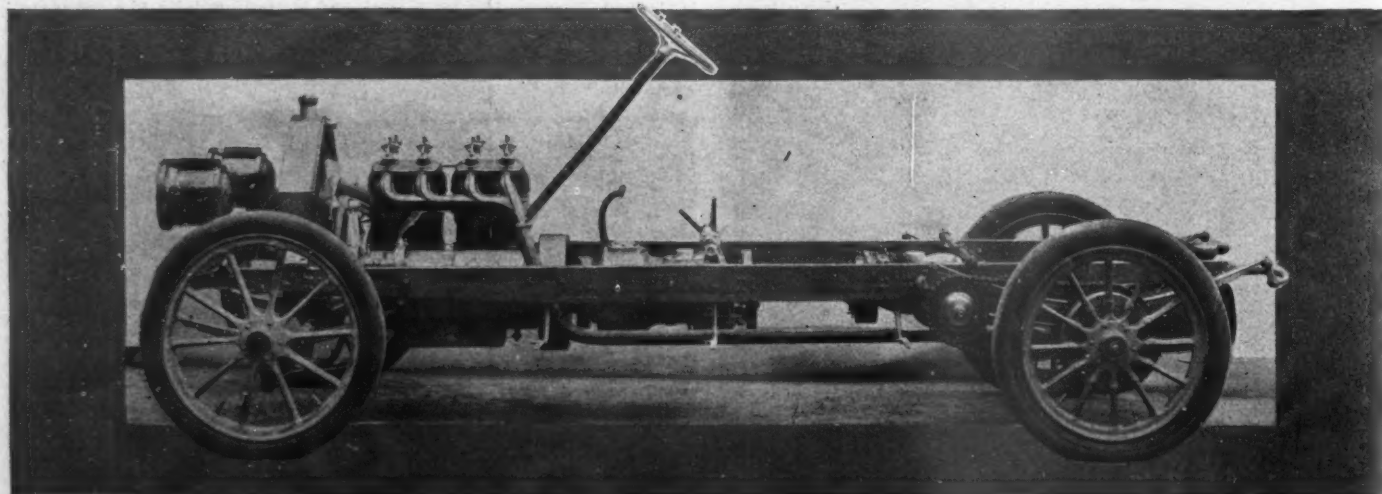
Nineteen hundred and eight will see three Peerless models, two of which are brand new creations fashioned almost identically after present Peerless lines but differing in horsepower and minor details. Of these two new members the six-cylinder proves

an interesting one and is treated under the six-cylinder classification. The new four-cylinder car, designated model 18, comes as a successor of the 1907 model 16, but embraces more than a dozen improvements. All Peerless models are altered in appearance by the use of 36 instead of 34-inch wheels. The model 18 has a dual ignition system in which one side is a magneto and the other an imported storage cell in conjunction with four-unit coil and timer. The plate forming the waterjacket heads were aluminum during the closing season, but copper is used for next year and the old four-blade fan, belt-driven, is replaced by a new six-blade design driven by bevel gears and a clutching mechanism. New in the motor is the use of flat-seated valves which give a greater opening for a given lift and have other claimed advantages. This type of valve has been used abroad for several seasons and in America by one of the leading makers of big cars. The exhaust manifold is now made in two parts united by a threaded union and so designed that the part of the manifold for the rear pair of cylinders is much larger in diameter than that part for the forward cylinder pair. Improvements in the lubrication are confined to lessening the number of oil leads and having two leads to the two crankcase compartments together with piping so that by using a two-way cock oil can be delivered direct to the crankcase from the oil tank. The gearset is improved in that the reverse gear which is clashed into mesh instead of being slid in does not have to be held in as formerly. The reverse gear is carried in the yoked end of a long lever fulcrumed into the cover of the gearcase.

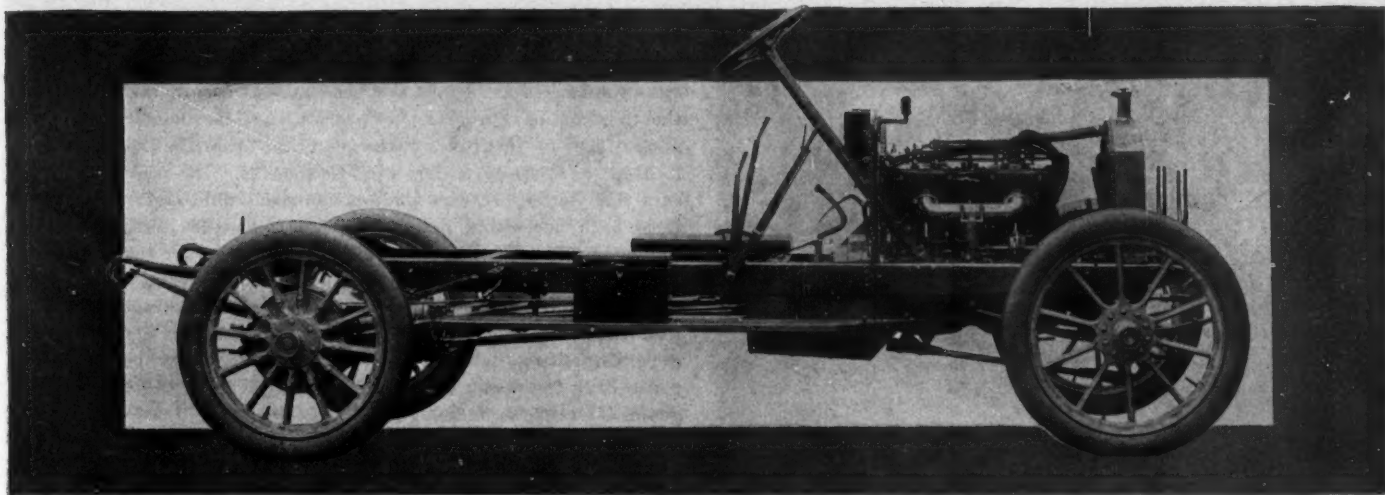


GEARSET AND ENCLOSED CLUTCH USED ON POPE-TOLEDO

The gear is carried on the short end of the lever and on the long end is a roller which works in a camslot in a sector, also carried in the gearcase cover. One of the gear-shifter rods has a rack on its upper surface for meshing with the sector so that sliding the shifter rod endwise partly revolves the sector and which through its camslot teeters the lever carrying the reverse gear and forces the gear into mesh. Once in mesh it will remain

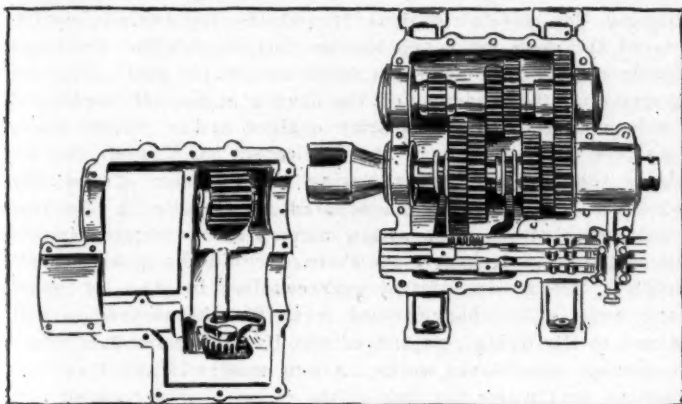


CHASSIS OF THE NEW POPE-TOLEDO AS EXHIBITED IN THE GARDEN



AS THE 1908 PACKARD LOOKS WITHOUT A BODY

there indefinitely until released by moving the shifter rod. The frames in all models are now dropped approximately $2\frac{1}{2}$ inches in front of the back axle, gearcases are supported on a three-point suspension and for next year flat semi-elliptic springs are used in conjunction with a rear platform system. These springs, from the Lemoine factory in France, are made of a special grade of silico manganese steel. Timken roller bearings are used in the



SELECTIVE GEARSET OF THE PEERLESS

front wheels and ball bearings in the other parts of the car except the motor bearings. Body changes include recesses in the tonneau sides in which sit the fenders, the absence of a step on the running board beneath the tonneau door and the absence of the scroll design at the lower front of the tonneau door. On the motor the cylinder castings are considerably altered in appearance by cutting away front and rear sides of the casting and also the ends of the valve chambers and fitting plates over these. This construction was followed in the aim of getting superior cylinder castings and to facilitate the removal of the core sand. On the 1907 cars the intake and exhaust manifolds carried oval-shaped flanges where they bolted to the cylinder castings, two studs being sufficient but for 1908 they end in triangular flanges and take three studs for securing each to the cylinder casting.

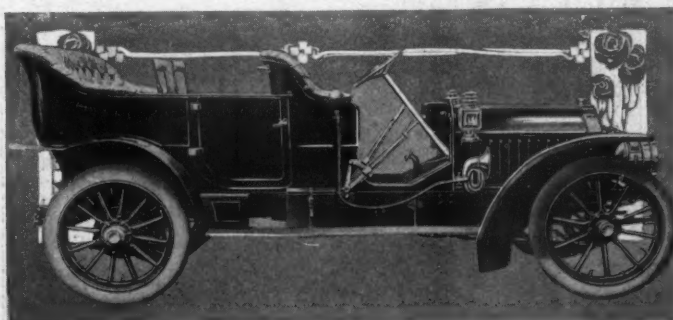
Packard a Development of Preceding Models

The 1908 Packard is a development of previous Packards and its make-up does not include any radical innovations but exhibits in several places minor detail changes in connection with the various parts of the car. Principal in these is the arching of the side members of the frame over the rear axle so that in spite of increasing the wheel diameter from 34 to 36 inches the floor of the car is not higher than formerly. The rear axle has been altered in external appearance by making the portion containing the differential larger and placing the webbing within the oval part of it, leaving the housing externally a plain oval, no webbing or trussing being visible. This change improves

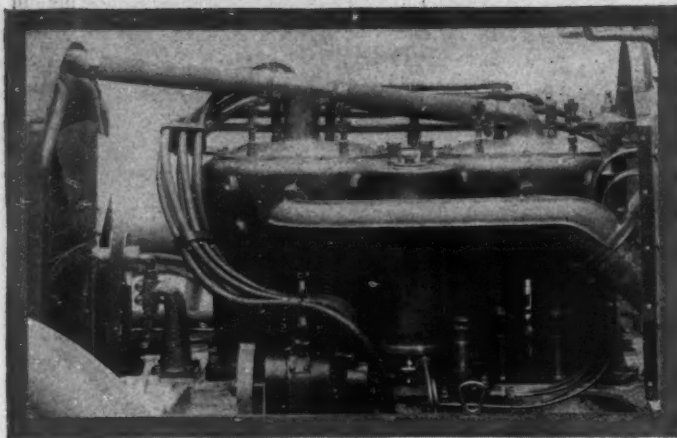
the appearance and increases the strength of the part. Not to be overlooked is increasing the wheelbase $1\frac{1}{2}$ inch, bringing it up to 123 $\frac{1}{2}$ inches, which extra length is placed in the rear of the dash and gives a slight increase in the tonneau. The tonneau cushion has been made thicker and is slightly higher in front, thereby making it easier for the passenger to sit in the seat and freeing him or her from that unpleasant forward slipping often experienced. Rear springs are made with wider leaves and the tonneau sides have semi-circular recesses into which the fenders sit, this change being necessitated by the lowering of the body. In the motor one change is taking the double-plunger oil pump from its 1907 position where it was driven by the timer shaft, placing it on the motor bed at the left and driving it by worm gear from the exhaust camshaft. The clutch improvement consists in reversing the direction of expansion in that the rigid end of the expanding band has become the loose end, the change giving a more gradual expansion and one claimed to be free from gripping. The steering wheel is made with an increased diameter and the diameter of the steering post also has been increased. Added to these changes is the use of a new style of universal joint at the forward end of the driveshaft, which joint is designed on the yoke type lines to take care of the angularity at that point, whereas the present style of roller joint suffices at the rear end of the shaft. An added improvement in the rear axle is made in that the driveshafts may be withdrawn without disturbing any of the gears. To increase steering the length of the steering knuckle spindle has been increased. In the roadster the wheelbase is reduced to 108 inches, the motor hung forward to the rear thereby distributing the weight more evenly on the two axles and, owing to the gasoline tank being carried in rear of the seats and low down, feed to the carburetor is by a pressure system.

Straight-Line Body Used in One White Model

White steam cars for 1908 are in two models, a 20-horsepower touring car with the well-known curved body characteristic of White design for a couple of seasons and a 30-horsepower machine to which is fitted a straight-line body, it marking the entrance of the White into this particular field of body design.



ROOMY-LOOKING PEERLESS TOURING CAR



PACKARD MOTOR, SHOWING MAGNETO

The 30-horsepower machine, styled model K, is improved over its 1907 prototype by the addition of 6 inches to the wheelbase, making that measurement 122 inches, and by having the engine and generator carried closer to the ground without reducing the present 10½-inch clearance of the car. The improvements on the 20-horsepower machine consist in increasing the generator capacity one-third, accomplished by making the tubes of larger diameter and suspending the motor on an aluminum pan supported on the frame side pieces, the motor base resting in an opening in the pan. As a reference to White steamers would not be complete without noting the changes made in the water and steam system, it will be necessary to draw close attention to this part of the car. By the control system introduced last year the temperature and pressure of the steam remain constant, irrespective of running conditions, and in maintaining this state of equilibrium a certain ratio must exist between the water pumped into the generator and the fuel needed to transform this water into steam. Constantly drawing water from the supply tank are motor pumps provided to deliver it to the generator. Closely associated with these is a diaphragm controlling a bypass water channel so in case the pumps provide more water than the generator demands the water is bypassed and returned to the pumps. The main water line to the generator branches into two channels, both of which have means for controlling the water flow. In one channel the controller is a thermostat which, when the temperature of the steam becomes too great, opens a valve and allows water to enter the generator. Controlling the other passage is a flow regulator which further controls the fire beneath the generator. To explain the action of these two regulators: Should the temperature of steam exceed 400 degrees centigrade, the bronze rod in the thermostat lengthening and pushing on a bellcrank, which in turn raises a valve seat, permits additional water to enter the generator. This lowers the steam temperature to normal. Immediately the thermostat rod contracts

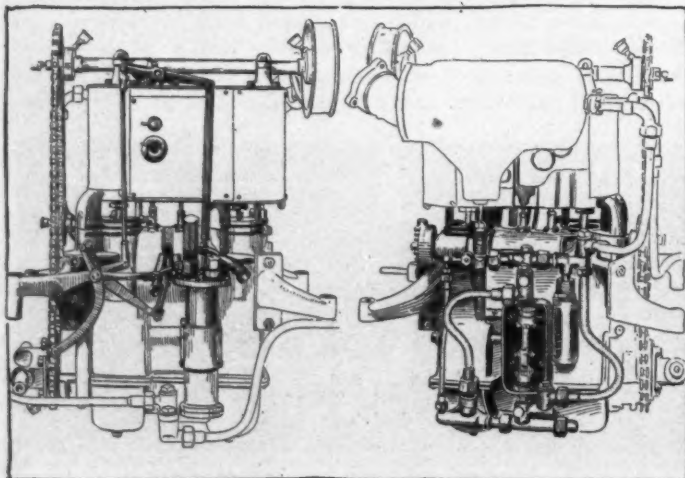
and a spring forces the valve onto its seat. The range of temperature, within which this thermostatic action prevails, is very limited—scarcely 10 degrees—and to assure the driver that the thermostat is working properly a dial thermometer is placed above the footboards of the car, the thermostat now being located accessibly under the footboards. In previous White cars the thermostat was made a non-removable element, but now it is both accessible and removable. In the illustration it is shown in the oblong housing with the front cover removed. The steam from the generator enters the horizontal tube leading from the right end of the oblong casing and as it passes through this iron tube the bronze piece within is heated by the steam and expands, acting as previously stated. The flow regulator for controlling the water flow in the other path for the water to the generator remains unchanged.

Matheson Offering Several New Features

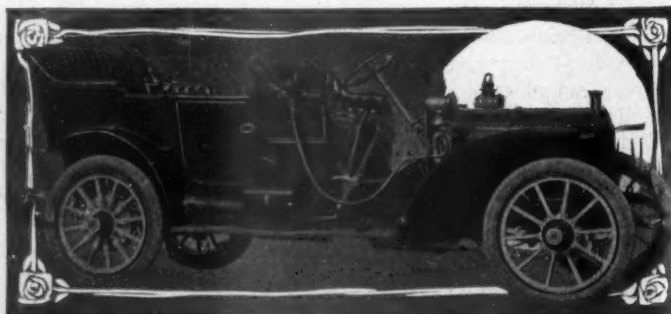
Matheson cars in 30-35 and 45-50 horsepower sizes, fitted with touring car, roadster, limousine or other body styles, constitute the 1908 offering of the Palmer & Singer combination. All have identical chassis except for the size of parts. Seen in both are upwards of half a score of detail alterations. The water pump position is altered in that it is carried to the rear of the left front motor arm. It is a gear instead of vane pump. Worm gears replace bevels on the top and bottom of the vertical shaft at the front of the motor for driving the overhead camshaft; a coupling joint is inserted in the magneto shaft. Raymond double-acting brakes are a part of regular construction, altering the radiator contour around the top, which has improved the car's front appearance. In place of the worm and double nut steering gear is a worm and sector gear. The rectangular oil tank, carried on the chassis at the left under the footboards, has had its capacity doubled and a plunger pump transfers oil from this to the lubricator. A Manzel oiler replaces the McCord and increasing the diameter of the rear wheel brake drums has necessitated an increase in the rear wheel sprocket diameter and a corresponding increase in the diameter of the jackshaft sprockets. Within the gearset direct drive is through an internal gear coupling in place of dental face teeth. The change speed lever for the reverse is now moved to the inside rear slot of the H slot quadrant in which the change speed lever works. A new muffler is added and the gasoline tank under the rear of the chassis has a rounded rear face. New ball-and-socket joints are found in the steering gear parts and the side members of the frame have truss rods added with the usual king post and turnbuckle attachments. The addition of a press button accelerator will be appreciated by Matheson users.

Two of the New Loziers Have Shaft-Drive

Three Loziers are ready for 1908. Model G is the present chain-driven car carried over without change and the other two are new creations, both with shaft-drive and one of which is a six-cylinder design. The new cars, known as models H and I, four and six-cylinder styles, respectively, are alike in general design other than in the number of cylinders. In the four-cylinder H, the motor rating of 45 horsepower has the bore ⅝ inch greater than the 1907 car and the stroke lessened ¼ inch, giving a cylinder with both measurements 5¼ inches. The conventional



RIGHT AND LEFT SIDES OF THE WHITE ENGINE

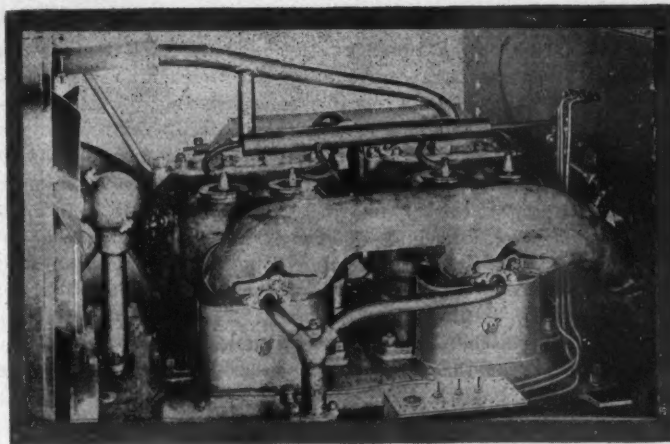


PACKARD THIRTY WITH TOURING CAR BODY

Lozier cylinders in double castings and with opposite valves remain, but now the nickel steel crankshaft is carried on three races of annular ball bearings. Each camshaft finds support on four bearings of this type. Added to this is carrying the magneto, pump and distributor shafts on the same type of bearing, which bearing incidentally is used in the transmission, rear axle, front axle and cross-shaft carrying the operating pedals. The valve stems and springs are housed by the use of semi-cylindrical aluminum cages secured by thumb screws and wing nuts, one housing for each twin casting side. The fan is driven by bevel gears in conjunction with a clutching mechanism. On the exhaust side is a new and very large exhaust manifold carried higher than the valve openings and having a branch to each cylinder head. The waterjackets, made without tops, have large plate coverings and in the combustion head is a threaded cap for furnishing access to the interior of the combustion chamber without removing the cylinder from the crankcase. Acting in conjunction with the carburetor is a Napier-style hydraulic governor which has a pressure diaphragm for controlling the piston throttle. The double ignition system includes a magneto combination and a storage cell with unit coil and high-tension distributor. The disk clutch has had the number of disks reduced from thirty-eight to thirty-three but their diameter is increased to 11½ inches and they now fill the interior of the flywheel instead of being carried in a drum-like continuation of the flywheel hub. The four-speed selective gearset remains, but altered in that direct drive is on the third instead of fourth speed and the countershaft is idle when driving on the direct. Considerable redesigning has been done on the gearset because of changing from side chain to shaft-drive and now it is carried through a three-point support. The chrome nickel steel driveshaft to the back axle is housed in a nickel steel tube which is supported at its forward end in a ball-and-socket joint within which is the only universal joint in the system. The rear axle is a floating construction, and between the clutch and gearset is a novel universal joint in the form of an integral gear coupling, the same as frequently used within gearsets for getting direct drive. Because of the discontinuance of the jackshaft, both brakes are placed on 14-inch rear wheel drums, one set expanding within these and the other clamping on them. Both sets are applied through equalizers working through slots in the side pieces of the frame, which frame is made from nickel steel instead of gun carriage steel.

Elmore the Only Two-Cycle Exponent

Elmore cars, the only exponents of the two-cycle motor at the show, are exhibited in three and four-cylinder styles of 24 and 35 horsepower, respectively, the three-cylinder chassis taking either roadster or touring car bodies and the four-cylinder chassis being fitted only with the touring car body. In both models is a variety of changes, chief of which in the motor is the enclosing of all shafts and gears such as the countershaft lying along the top right of the crankcase, which is encased in a tube and runs on roller bearings. Gears at the forward end of the motor for driving this shaft from the crankshaft are encased, running in oil; the gear and shaft combination for driving the Atwater-Kent igniter on the dash has its transmitting gears and shafts encased. Instead of driving the oiler by belt, gears

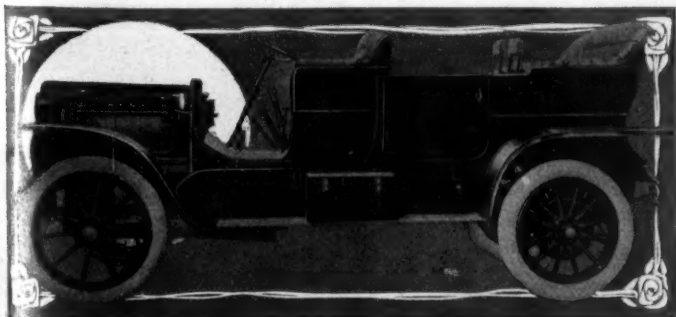


VIEW OF THE LOZIER FOUR-CYLINDER MOTOR

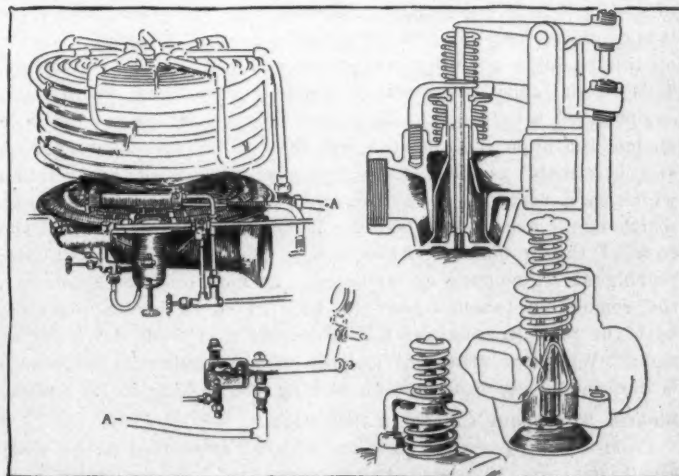
suffice; a Hancock multi-feed lubricator is positioned; ignition current comes from dry cells and is passed through an Atwater-Kent system; in the carburetor is a priming device in the form of a cup receptacle surrounding the nozzle, which cup fills when the motor stops and contains sufficient gasoline for starting. In the transmission portion of the chassis is the introduction of an expanding clutch with bronze and cast steel in the friction members; the adoption of a selective Brown-Lipe gearset with the looked-for three forward speeds; the enclosing of the driveshaft in a tubing together with squaring the front end of the shaft where it enters the only universal joint of the system; taking one set of brakes off the driveshaft and locating both sets on the rear wheel drums, one set expanding with the drums, the other clamping on them; using a stout design of Weston-Mott rear axle with Brown-Lipe differential and having the inner ends of the driveshafts a squared fit into the differential; suspending the frame in rear on a three-member platform spring with the cross member located under the rear cross piece of the frame and fitting Sager supplementary springs in conjunction with this; increasing the wheel strength by the use of spokes ¼ inch wider, as well as carrying them on ball bearings of larger size; adding an interlocking device on the gearset so the clutch cannot be engaged until the gears are completely meshed; the addition of a double worm steering gear; increasing the driveshafts and housing of the rear axle ¼ inch and fitting a double worm steering gear. Although the body lines will be recognized readily as Elmore's, still changes are present in the way of newly-designed front fenders with steel mud shields between them and the car body, the fender being free from plowshare lines. The selling equipment includes Gray & Davis lamps and generator.

Autocar People Putting Ont Two Chassis

There are two Autocar models for next year, one the 12-horsepower runabout and the other the 30-horsepower chassis



ONLY STEAMER IN THE SHOW—THE WHITE

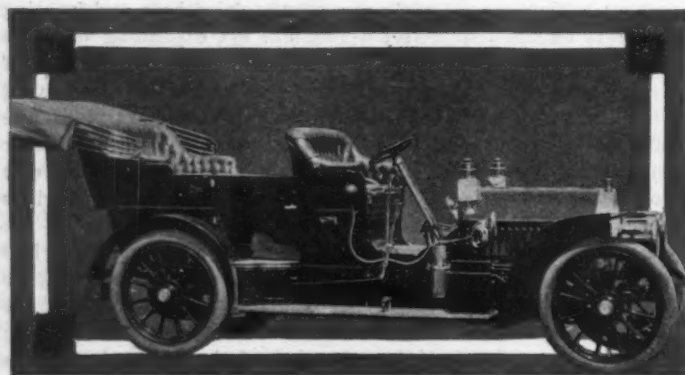


WHITE GENERATOR AND THERMOSTAT AND FRANKLIN VALVES

which is sold with the touring car, roadster and limousine bodies. In the 12-horsepower runabout the improvements include the presence of a brass strap surrounding the basement radiator and selling the car with an equipment consisting of headlights, generator, storage cell and top. The remaining features of the car remain as at present. In the 30-horsepower car the chassis is practically identical with a year ago and the body different only in striping and other details. The limousine has been made larger and more luxuriant in many respects. To those not familiar with the Autocar line it will be sufficient to state that the 12-horsepower runabout has an opposed water-cooled motor with automatic intake valves and that transmission is through a three-disk clutch, sliding gear transmission and shaft-drive. The crankcase of the motor and gearcase are bolted together, the intermediate casting enclosing the flywheel and giving the motor and gearset a three-point suspension. In the four-passenger cars there is the same unit power and transmission plant and three-point suspension. The big cars are roller bearing vehicles except in the motorshafts, which are carried on plain bearings. A magneto is not made a regular equipment on any models, but provision is made for attaching it.

Locomobiles Are Without Pronounced Alterations

Pronounced alterations have not been made in the Locomobile models for 1908, which continue two in number, known as model E in the small car and I in the large car, the former being the same model designation and the latter taking the place of the 1907 H. In the H or large car there is an increase in power by a $\frac{1}{2}$ -inch increase in measurement in bore and stroke. This car



FORTY-HORSEPOWER LOCOMOBILE

also has 6 inches longer wheelbase and wheels are 2 inches greater in diameter. The magneto now has its strap bolted at the top instead of at its side and on the big car is supplemented by a storage battery. In the smaller car the cylinders have cap plates above the water space, as does the larger model. In the small car the speed change has been given one more, now being four forward. The operating lever works in a selective instead of over a selective quadrant. Priming cups are placed above the intake valves instead of in the cylinder heads. The clutch spring on this model is enclosed, whereas it was not in the 1907 design. This model has low-tension magneto only and is without compression reliefs which its bigger brother possesses. On both models the upper half of the crankcase is of manganese bronze and this metal is used in the gearcase for the central portion which carries the bearings, the upper portion being of aluminum, which metal also is used for the bottom portion of this and the base of the crankcase. Each chassis may be had as runabout, touring car, limousine or landaulet. In model E, the small car, the removable tonneau may be had which is interchangeable, with the rear deck having a rumble seat that folds down out of sight. When the small car is built as a limousine its wheelbase is increased 14 inches over the touring car, making it 116 inches.

Stearns Tourabout Creates a Sensation

From a body point of view the Stearns attraction is the tourabout with its staggered front seats, the left one further to the rear than the driver's seat in order to give the steersman



OLDSMOBILE FOR 1908—MODEL M

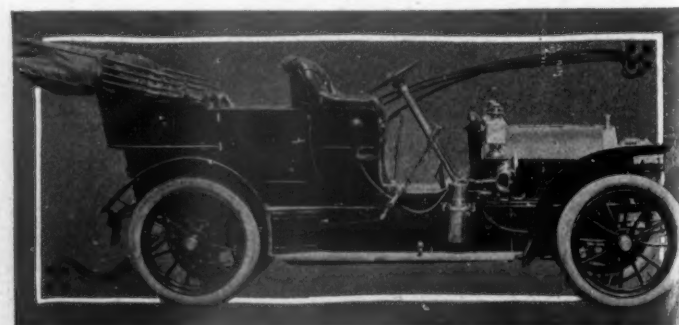
more room for handling the wheel. The tonneau is a miniature two-passenger space and on the left running board is a chauffeur's seat. Hanging the radiator in the front axle plane improves the car's appearance. Besides this the company makes its regular line of touring car and limousine bodies. The motor has been considerably redesigned in that the Lavigne oiler is carried in the right front motor arm, exactly where the Haynes has its oiler, in the left front motor arm is the water pump. An exceedingly neat job has been done in designing the housing for the half-time gears and the radiator rest. Placing the oiler and pump in the motor arms simplifies the motor materially. The timer now is located on the top of a short vertical shaft at the right of the front cylinder pair, the shaft rising through the oiler housing. The magneto is carried on the right center motor bed and takes its drive through a shaft paralleling the crankshaft and which drives the oiler. The six-cylinder Stearns is a most attractive creation and follows the four-cylinder car in general outlay of parts as well as in the use of ball bearings for the motor shafts.

Simplex Only Pleasure Car in Basement

The only pleasure cars to hold forth in the basement are the Simplex machines and which machines are best known as Smith & Mabley Simplexes, although known by that name no longer. In the 50-horsepower machine, which is the only model manufactured, are two changes, first the discontinuance of dual ignition and the adoption of a Mercedes type of radiator. The ignition system is now confined to a high-tension Bosch magneto from which four wires connect with the spark plugs located in the caps over the valves. The system is one of the most simple at the show and the Simplex people assert that trouble is not met with in starting.

Apperson Introduces a Medium-Priced Car

Chief of interest in the Apperson stand is the exhibition of a \$2,750 four-passenger car and a six-cylinder car. The four-passenger car marks the entry of this maker into the medium price class, and the importance of this entrance can be appreciated when it is discovered that the car has all the parts of the big cars, including separately-cast cylinders with opposite valves, dual ignition with magneto and batteries, Krebs design of carburetor, three-speed selective transmission, shaft drive, floating rear axle and internal and external rear wheel brakes. Analyzed, it possesses all of the approved marks of a high-priced car, and



MODEL E OF THE LOCOMOBILE FAMILY

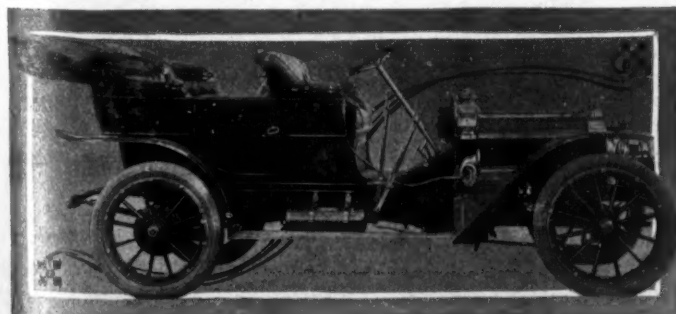


APPERSON IN FULL TOURING RIG

in the garden plays much the same role in the medium-priced field that the little Buick does in the cheap car class. In every detail the big car design is copied and ball bearings fitted in the transmission, rear axle and front road wheels. In order to economize motor space the front and rear faces of the water-jackets are cut away and plates affixed, thereby allowing of the cylinders being well grouped. A difference in crankcase design shows a discontinuance of that Apperson method of carrying the camshafts outside the crankcase. Now they are placed conventionally within the case. The magneto finds location on a detachable bed low down between the motor arms on the left, and has its current delivered to a set of plugs over one set of valves, whereas the storage battery system uses a set of plugs over the other valves. The timer location is absolutely new with the Appersons and is on the top of a vertical shaft between the second and third cylinders on the right. The gear water pump remains on the forward end of one camshaft and the small-sized carburetor is on the right. Oiling is through a McCord lubricator on the dash. The clutch is a clamping steel band acting on a bronze facing on the flywheel flange. A sub-frame is not used, the wheelbase is 106 inches and equipment includes five lamps, a generator and tire holders. Of the other Apperson models the 50-55-horsepower Jackrabbit remains unchanged; the touring car with this motor has not undergone alterations. The new six-cylinder machine follows closely Apperson design and is characterized by the compactness of its motor, which has been so compressed that from the radiator to the dash is but 4 $\frac{3}{4}$ inches more than in the four-cylinder car. The transmission portions include the Apperson band clutch, selective transmission and side chain-drive.

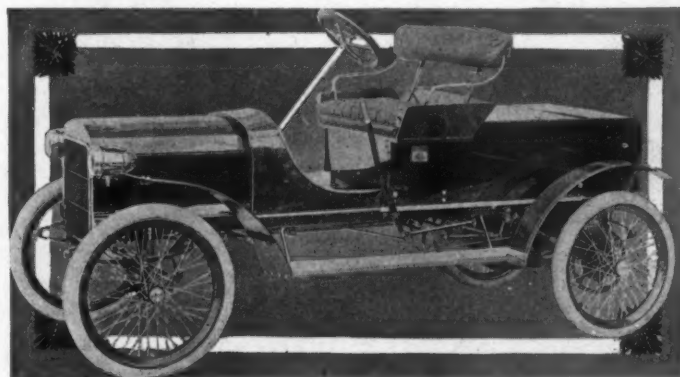
Air and Water-Cooled Corbins Are Shown

"Desiring to emphasize the fact that it is producing a water-cooled car merely to supply the agents with either type of car and thereby enable the agent to close all possible sales" is the way the Corbin corporation introduces its new 30-horsepower water-cooled machine. The company has not entirely forsaken air-coolers; it will manufacture four models, with two styles of chassis differing only in motor power. In the 24-horsepower chassis, which is made in roadster and touring car lines, a dual ignition system is positioned, one set magneto, the other storage cell, four-unit coil and timer. In the 30-horsepower air-cooler, also made in touring car and roadster lines, the magneto ignition is counted an extra. The water-cooled



CORBIN'S 30-HORSEPOWER MODEL

Corbin is primarily water-cooled cylinders mounted on the same crankcase as used in the 30-horsepower air-cooled cars with such extras as water-cooling calls for and a slight rearrangement of motor parts. In this new motor individually-cast cylinders with integral waterjackets have interchangeable valves on the left, opened by direct lifter rods which do not bear upon the cams at their lower end. Over the cam is a short lever hinged at one end on a boss on the inside of the crankcase and with its other end rounded on the lower side where it rests on the cam and flattened on its upper side where the end of the lifter rod reposes on it. The crankshaft has its diameter increased to 1 $\frac{1}{2}$ inch and it has annular-ball end bearings and plain center bearings, three of the latter being used. The timer, new on these cars, is located on the top of a vertical shaft between the third and fourth cylinders at the left, being driven off the camshaft. On the right side is a layshaft for driving the water and oil pumps, both of which are of the gear type. The water pump, drawing its supply from the base of the cellular radiator, delivers it to the waterjackets at the lowest point on the right side. The escape is from the top of the jackets to the radiator top through a graduated pipe. The gear oil pump delivers its flow to a header, and on the dash is a sight feed whence the flow is by gravity to the four crankshaft bearings, the center crankshaft bearing being oiled from pockets filled by the splash. A new fan adjustment is in place consisting of carrying the fan on the short arm of a lever fulcrumed on the forward cylinder and with the long arm of the lever pulled upon by a coil spring whose tension constantly tends to keep the fan belt tight. In both air



ORIENT BUCKBOARD IN NEW DRESS

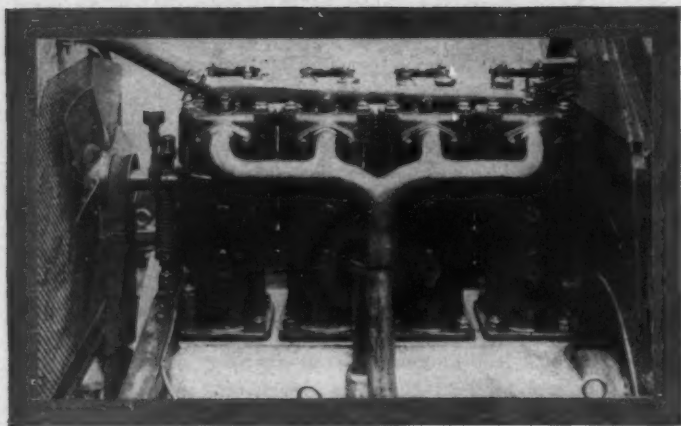
and water-cooled Corbins the clutch, transmission parts and running gear remain unchanged.

Waltham Also Has a Water-Cooled Model

The air-cooled Orient cars and buckboards are supplemented for next year with a water-cooled car shown in runabout, roadster and delivery car styles. It has a two-cylinder opposed motor mounted transversely not under the bonnet but approximately under the dash of the car. In front of the motor is a radiator not placed to form the front end of the bonnet but entirely concealed within the bonnet and located approximately about the center of it. The front of the bonnet is a screened opening much as used on air-cooled cars and the trouble has been taken to add what looks like a water-filling cap above the screening. The friction transmission system includes a friction wheel with a beveled periphery carried on a sliding extension of the crankshaft. This wheel when pushed to the rear contacts with the bevelled periphery of a similar friction wheel on a cross shaft. On the cross shaft ends are side chain-drive sprockets.

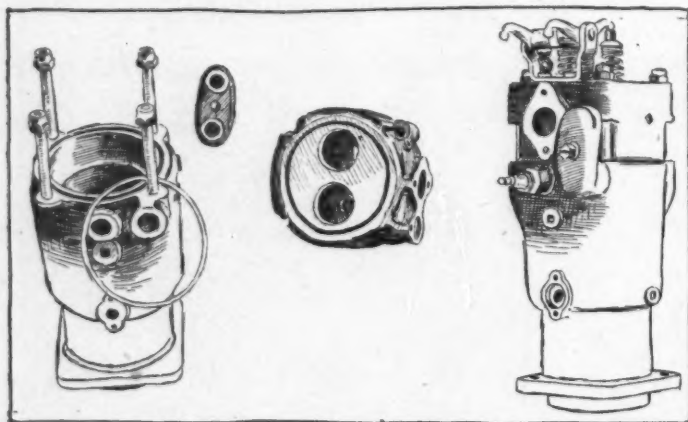
Haynes Using Three Types of Motors

Haynes has three 1908 models, all with entirely different four-cylinder motors but with transmission parts strikingly alike except for differences in size to correspond with the motor demands. The smallest car, model S, a 25-horsepower car, remains practically as during 1907 except for strengthening those parts in which weaknesses were discovered. The new car and



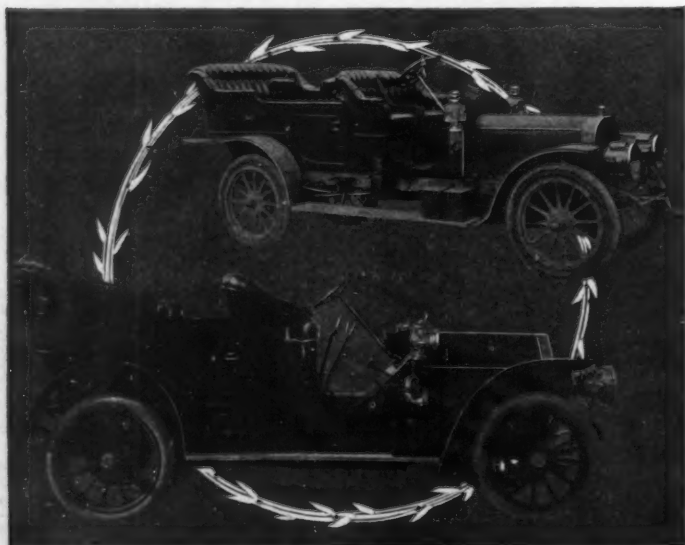
WATER-COOLED ADDITION TO KNOX FAMILY

one with a very ingenious motor is model W with a 40-horsepower rating and $4\frac{3}{4}$ by 5-inch cylinders. Casting the cylinders in pairs is not new with the company, but making the heads flat so the tops of the valve chambers, which are opposite, and the cylinder heads are on the same level is. The motor has two flywheels, a 50-pound one at the front and a 100-pound wheel at the rear, the forward wheel being added to reduce the whip on the shaft occasioned by carrying a heavy flywheel on the rear end and driving the entire car through that end, whereas the



KNOX WATER-COOLED CYLINDERS

front end has no greater strain than driving the fan and half-time gears. Exceedingly new in this motor and a design that already promises to be widely copied is making use of the two front motor-supporting arms, both of which are made wider and deeper than formerly. The left one is an oil tank with $\frac{3}{4}$ -gallon



KNOX, MODEL E

HAYNES TOURING CAR

capacity and in the right arm is the McCord lubricator, geared direct off the camshaft. The increased size in the motor arms does not interfere with any of the other motor parts and the reduction in congestion on the motor sides is most apparent. The valve chambers on opposite sides are very large, affording more water space for the valves and heads than ever before used in Haynes cars. Valves are made with extra large diameters. The intake manifold—a Y with a branch to each cylinder pair—enters the floor of the ports and not the side, a construction that simplifies the motor's appearance. The crankshaft is offset from the cylinder centers $\frac{1}{2}$ inch. The dual ignition consists of magneto and storage cells. The camshafts are housed entirely within the crankcase. Waterjacket tops are cut away and removable plates affixed. In the running gear and transmission parts there remains the band clutch, selective gearset with clutch master gear on the countershaft, and the rear axle with a solid shaft from road wheel to road wheel and with the differential driving one wheel through this shaft and the other wheel through a sleeve together with roller pinion drive. The frame is stouter than in the 25-horsepower car and the back axle improved in that the solid driveshaft is of slightly reduced diameter in the half that takes the driving sleeve so that the sleeve diameter is equal to that of the other half of the shaft. In the 60-horsepower model U two flywheels are fitted, weighing approximately 50 and 125 pounds respectively for front and rear. The wheelbase has been lengthened from 110 to 118 inches, the wheels increased in diameter from 34 to 36 inches and the tonneau provided with 12 inches additional length, as well as two folding auxiliary seats. A straight wood dash is used.

Oldsmobile Makers Have a New One

Two new cars and one old model improved are in the Oldsmobile booth. The first new model, known as X, is a \$1,900 four-cylinder car with a motor very much like the 1907 model, and with a running gear fashioned largely after that designed for the two-cycle car exhibited a couple of seasons ago. The 1907 model M has cylinders with the bore increased $\frac{1}{4}$ -inch, making it $4\frac{3}{4}$ inches, and otherwise improved by the use of a transmission with Hess-Bright bearings, in which no gears are in mesh on direct drive, the countershaft being thrown out of mesh. The wheelbase has been lengthened, the wheel diameter increased from 32 to 34 inches, elliptic springs used in rear in place of semi-elliptics, front springs increased in width to $2\frac{1}{4}$ inches, the body made $4\frac{1}{2}$ inches wider, a dropped frame used in which the side members drop approximately $3\frac{1}{2}$ inches in front of the back axle, and the front axle made heavier. The second new car is the six, with its Hess-Bright bearings for the crank and cam shafts, a new design of transmission with sliding gears on the main and counter shafts, thereby reducing the number of gears in the case to seven, and the use of magneto and battery ignition. The car has 36-inch wheels and full elliptic rear springs. Complete details of the six motor appear in this issue under the six-cylinder heading.

Knox Turning Out Air and Water-Coolers

For next year the Knox factory will produce water and air-cooled machines according to the demands of buyers. The new water-cooled car is not a new design but comprised of the standard model H chassis fitted with water-cooled cylinders, a radiator, water pump and water-piping system. The two air-cooled models are continued, the H car being improved by the use of more flexible springs and a body of increased size, being 6 inches wider, 4 inches longer and otherwise more commodious than this year. The big model H 40-horsepower machine with chain-drive remains unaltered. In analyzing the water-cooled model, styled L, the use of separately-cast cylinders is anticipated when it is recollected that the motor uses the same crankcase as the air-cooled H. The cylinder castings are most interesting in that the heads are separate and further because the waterjacket space in the head is entirely separate from the waterjacket space in the cylinder wall, which has been done in order to guard against leakage at the union between the head and cylinder. The water circulation enters the lowest point of the cylinder

jacket space and escapes from the top of the space through a small flattened U pipe that conducts it into the cylinder head jacket space, and is fitted on the right side and held in place by a center stud. The final water escape is through the top of the head. The head is secured to the cylinder part by four vertical studs and to make a gas-tight union the upper end of the cylinder casting is counterbored, leaving a shoulder upon which rests a ring-shaped copper asbestos gasket. Upon this gasket the correspondingly shaped head rests. Intake and exhaust valves located vertically in the heads are opened by separate rocker arms worked from one camshaft. Because of this location the surrounding water space is very large. The interior of the cylinder head is machined all over and the inside bore of the spark plug hole is machined also. The head is cored for the intake and exhaust valve passages. In removing a valve it is first necessary to remove the intake and exhaust manifold connections, the return flow water pipe and the cylinder head, all of which is quickly done owing to the accessibility of the nuts. The motor has a well-grouped arrangement of oiler, timer and water pump at the right rear, the timer and oiler on the top and bottom respectively of a vertical shaft geared off the camshaft and the water pump worm-driven off the timershaft. Oil baffle plates are fixed to the bottoms of the cylinders and cooling is through a Whitlock radiator.

Many Changes Made in the Pope-Hartford

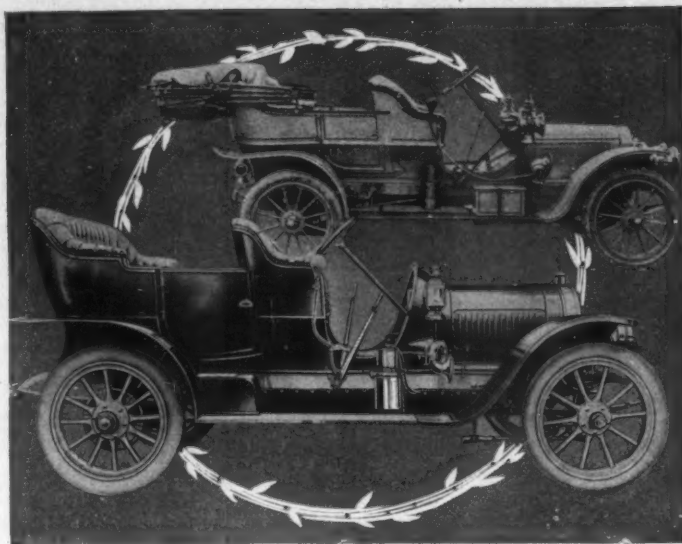
While retaining its four-cylinder motor with valves in the head the Pope-Hartford has joined the rank of cars showing many changes. The wheelbase has grown to 113 inches, showing an increase of 1 foot. The wheels have likewise jumped from 32 to 34 inches in diameter, a four-speed and reverse selective transmission with shafts carried in one vertical plane and running on plain bearings is used and in connection with it the Pope-Hartford sector-and-rack method of shifting gears has become obsolete, giving place to a conventional selective mechanism in which all parts are completely housed in the top of the gearcase. Shafts and gears are chrome nickel steel and squared shafts are used for connecting with the rear axle and for driving members within the axle. On the motor are two ignition systems, an Eisemann high-tension magneto as well as a storage cell, with separate sets of plugs. A Lavigne oiler replaces the 1907 style and it feeds the motor through one glass sight on the dash. Improvements in the clutch include the use of thirty-nine 1-inch cork inserts in the leather facing of the cone part. Between it and the gearset is fitted a new waterproof universal joint. Rear springs have been lengthened 4 inches, bringing their length to 52 inches and the front axle now reposes directly beneath the radiator. Noted also is a new design of body 6 inches longer and 3 inches wider and deeper than formerly, carrying remodeled non-plowshare front fenders, a mud shield filling the space between the frame and the fenders and running board. A metal mud apron is beneath the motor and clutch. The steering wheel has an increased diameter, the increase measuring 3 inches, bringing it up to 18 inches. The carbureter is fitted with a vertical throttle located over the mixing chamber.

Pope-Tribune Practically the Same as in 1907.

The Pope-Tribune goes to the 1908 buyer practically as it went to the 1907 purchaser, excepting in that it will now be purchaseable with either runabout or touring car bodies, the touring car body having accommodation for five passengers and being of the straight-line design.

Thomas Company Puts Out a Town Cab

One American builder who a year ago realized the significance of the taxicab movement and who is regarded as being in a better position to meet the enormous importation of these cars into New York is the Thomas Buffalo company which exhibits its 16-22-horsepower town cab. Combined in this little cab are more novelties of construction than can be found in any other booth in the garden, and Designer Chedru must have lost considerable gray matter and avoirdupois before the design was completed. To begin: The motor has its four cylinders in one casting—en bloc the Frenchman terms it—and the motor

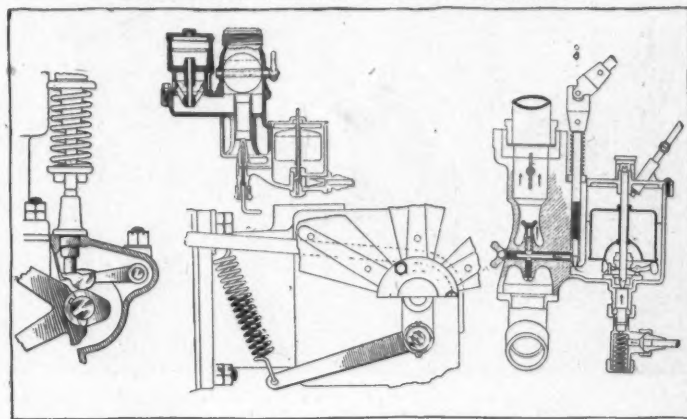


POPE-HARTFORD

HAYNES, MODEL N

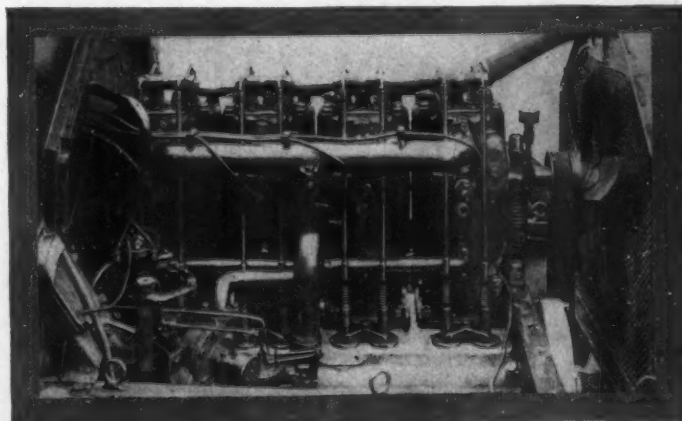
consists of two castings, one containing the four cylinders, the valve chambers and the intake and exhaust manifold and the other the crankcase, which also forms the mixing chamber of the carbureter, the water intake pipe and a few other minor parts. The bore and stroke are $3\frac{1}{4}$ and $4\frac{1}{8}$ inches and so compact is

CORBIN VALVE LIFTER AND THOMAS CARBURETER

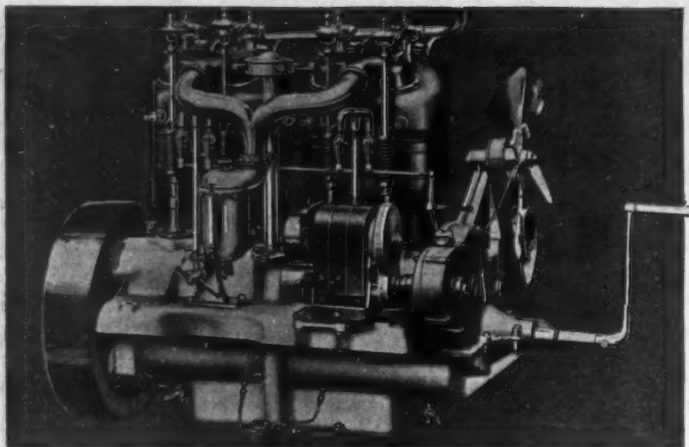


CORBIN FAN BELT ADJUSTER AND FRANKLIN CARBURETER

the arrangement that only two bearings are used on the crankshaft—one at the front end and the other at the rear end. The motor is water-cooled with a thermo-syphon circulation and the integral exhaust manifold has air-cooling flanges. The throttle is in the intake pipe. Ignition is by a Bosch magneto, which is so mounted as to be removable without the use of a tool, wing nuts holding the anchoring straps in place as well as the housing for the magneto gear. The motor has a three-point support. Crossing in the rear of the crankcase is a tubular



MOTOR USED IN MODEL L KNOX



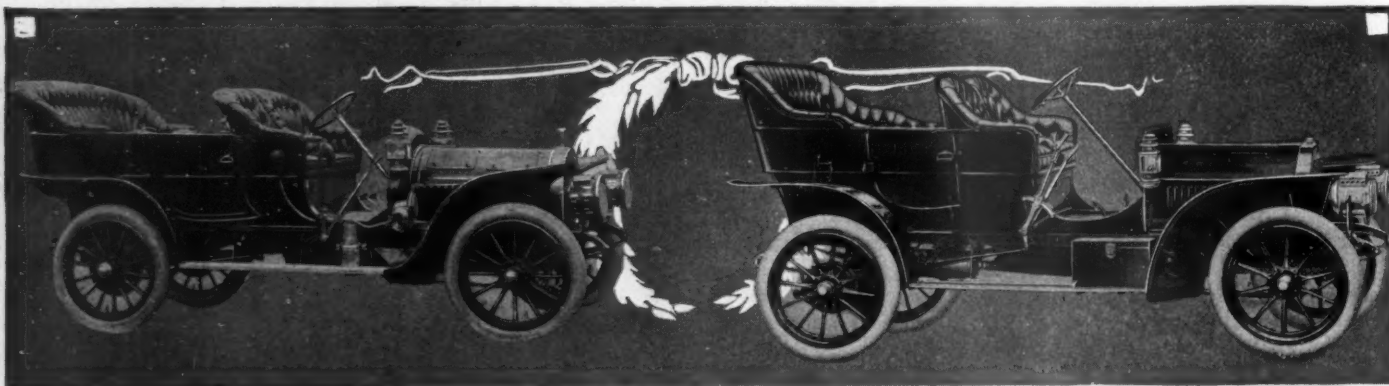
THE NEW POPE-TOLEDO MOTOR

member passing through two eye holes in the end of the crankcase. In front the crankcase rests on a central point. Closing the entire top of the waterjacket space is a brass plate. The lubricator is a pressure feed device located on the dash with leads to the two compartments of the crankcase. In the running gear attention is invited to the selective gearset carried in a manganese bronze case on the rear axle, the use of a double set of expanding brakes within air-cooled rear wheel brake

supported to a cross piece of the car frame. The front axle is a straight tubular piece with the tie rod in rear. Steering knuckles are of the Elliott type with the car weight carried on one ball in the top jaw of the knuckle. In all there are twenty-eight sets of annular ball bearings in the car, two of which carry the motor crankshaft. The quadrant in which the change speed lever operates has the teeth on the under side; the quadrant bracket is absolutely enclosed, nothing being exposed to dust except that which enters through the two slots, one in which the speed change lever works and the other in which the emergency brake lever travels. The body of this rig is of a landaulet type.

Studebaker Using the Regular Garford Chassis

Studebaker cars for 1908 will be the regular Garford chassis which remains practically as it was during the present season. In speaking of this policy the company claims that "to the student of motor car construction the day of exclusive features, commonly referred to as talking points, has passed," and that the Garford chassis in its mechanical construction "is based on a continuous policy of fundamental mechanical facts." The cylinders of the motor are cast in pairs with integral waterjackets and opposite valves. Ignition is by low-tension magneto with the hammer block placed in the head of the intake valve housing and covered with an attached aluminum casing. The chassis are in two powers, the smaller having a progressive gearset and the larger selective, final drive in both being by cardanshaft and



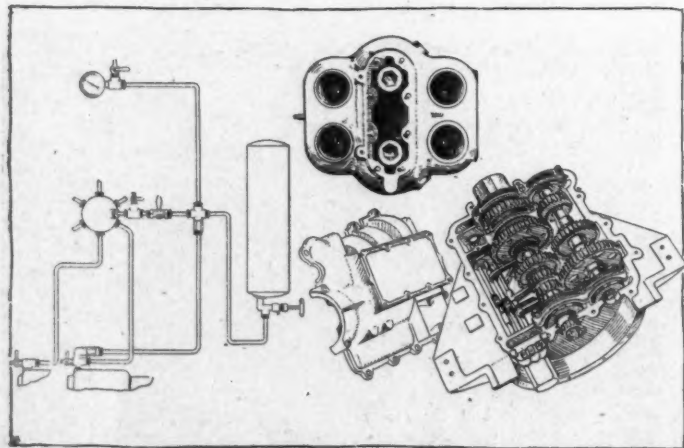
TWO OF THE NEW TOURING CARS, THE ROYAL TOURIST AND CADILLAC

drums. Each brake has a face width equal to one-half the width of the drum face. The cooling flanges are six integral constructions circling the brake drum. The screw and double nut steering gear, carried beside the motor on the rear right, is adjustable at the point where the column enters the steering gearcase by loosening a lock nut and tightening a nut until the desired adjustment is reached. In the motor flywheel is a three-disk clutch. Drive to the rear axle transmission is through an encased drive shaft, with the forward end of the shaft casing

floating rear axle. Mechanical lubrication and conventional water-cooling are motor parts. A platform spring suspension is used in the rear on all models, which in the smaller chassis are runabout, a limousine and a touring car while in the larger one it is only a touring car.

Three Chassis Seen at Cadillac Stand

The Cadillac stand displays three chassis models, the 10-horsepower single-cylinder type, the 20-horsepower four-cylinder model G and the 30-horsepower four-cylinder H. Chief in the alterations of the single-cylinder car is the fitting of a stanhope body with the unchanged radiator lines. The wheelbase has undergone an elongation process of 6 inches, achieved by carrying the forward axle 3 inches ahead and the rear axle the same distance back, incidentally making the wheelbase 82 inches. Hand in hand with this is a 6-inch increase in the length of the rear spring, making it a pretentious 42-inch member. An added running board on each side uniting the fenders improves the appearance wonderfully, as does a little extra rake in the steering column. The car is sold still with the victoria style of body as used for several seasons should the buyer demand such. The whole attention of the Cadillac factory has, however, been directed to perfecting the minor details of the 20-horsepower G car and making a closer fitting of parts. This car has a selective gearset. The rear end of the transmission shaft of the gearset has an annular ball bearing substituted for the roller bearing, rollers carrying all other parts of the transmission. A solid roller bearing replaces the Hyatt roller in

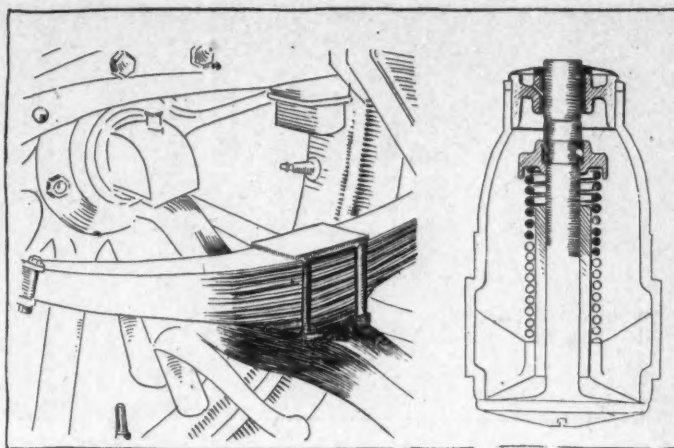


WINTON SELF-STARTER AND LOZIER CYLINDER HEAD AND GEARSET

supporting the pinion shaft in the rear axle and the axle drive shafts have undergone a $\frac{1}{8}$ -inch increase in diameter and have been slightly hardened. The 30-horsepower touring car is manufactured in touring car, limousine and roadster lines and has been improved by discarding the throttle governor and adding a straight line body.

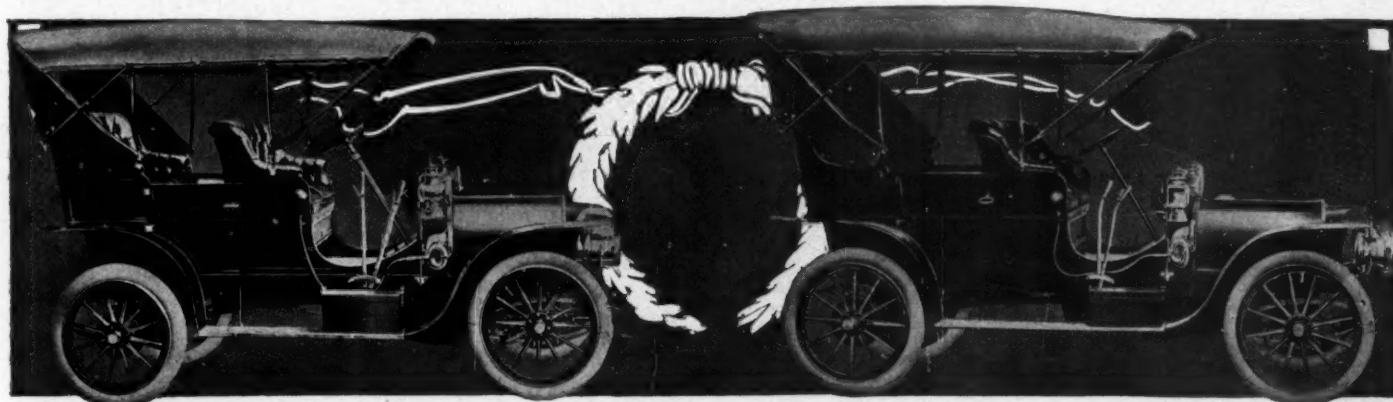
Horsepower in the Franklin Increased

As in 1907, the 1908 air-cooled Franklin will be made in G, D and H models, the last named a six-cylinder machine. All are higher powered, the G increasing from 12 to 16 horsepower, the D from 20 to 28 and the H from 28 to 42. By far the most important feature of the cars and what is an absolute innovation in motor car design is the use of concentric intake and exhaust valves in the cylinder heads. To insert these new valves each cylinder casting was redesigned in order to have a hemispherical combustion space. In the top center of this space are the two valves. The exhaust valve is a poppet style; the intake is an inverted funnel and has the exhaust closing the funnel mouth. When the exhaust opens the exhaust gases escape into the funnel and pass out through three triangular holes in the upper or coned part of the funnel. When the intake valve opens the funnel is pressed down into the combustion space and of necessity carries the exhaust with it, the intake gases rushing in between the funnel and its seating in the cylinder casting. The valve springs are one above the other, the exhaust spring being above and of small diameter and supported on a curved arm supported on



POPE-TOLEDO SPRING CLIP AND DOUBLE VALVE STEM

revolving contact make the roller constantly bears upon a ring surface composed of metal segments or plates of double the number of cylinders. One set of segments are live in that they connect with the wires, but the alternate set is dead. Between the adjacent segments is an air space. All of the segments are held in an insulating ring within the timer casing. Using a double set of metal segments gives a continual metal ring for the roller to bear upon. In the D model ball bearings are



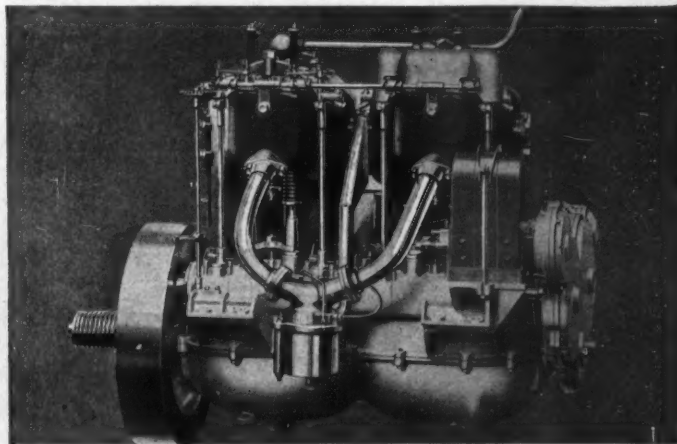
MODELS G AND D OF THE FRANKLIN COMPANY'S 1908 LINE

the cylinder casting. The intake valve is of large diameter and rests on the top of the cylinder casting. Two rocker arms are needed for each cylinder, one for the intake valve and the other for the exhaust valve. The Franklin car which made the record Chicago-New York run during the early fall had a motor with these valves. The company has branched out in the D and H cars by fitting a Bosch magneto, locating it in the left front motor arm within a D expansion. The assisting system is a storage set with its own spark plugs. On these motors phosphor bronze flanges are fitted over the cylinder walls and the number varied on the different cylinders. In the D model the first cylinder has sixteen, the second twenty, the third twenty-six and the fourth twenty. Phosphor bronze has a heat-radiating efficiency of five to one compared with cast iron. On the D and H models a selective gearset with an improved self-finding quadrant for the change speed lever is used, but on the G the sliding set remains. The improved carburetor in use on all has three essential changes. The spraying nozzle has several small openings for the gasoline to emerge from instead of a single opening, the result being comparable with a gas chandelier. This nozzle is placed in a strangling tube formed on venturi principles, the nozzle being at the smallest diameter part of the tube. The float chamber is a Longuemare design, the float loose on the stem but resting on a pair of levers pivoted to pedestals in the base of the float chamber and with their short ends bearing upon a collar on the float stem, the float resting on the long end of the levers. The timer is improved in that in the

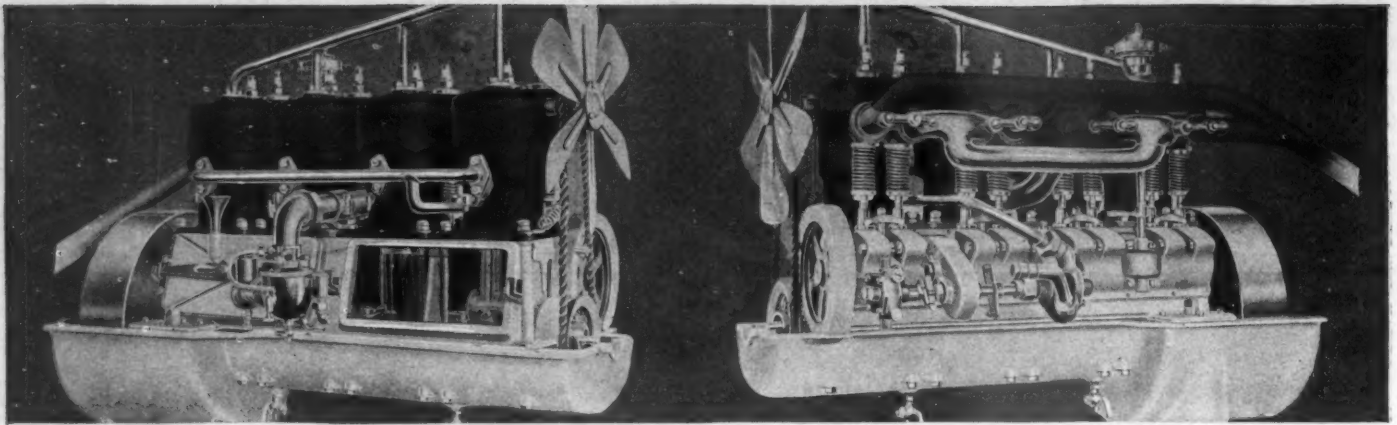
introduced on the motor fan. The model G cools as usual without the aid of a motor fan.

Royal Uses Selective Transmission on One Model

Although few changes have been made in the Royal Tourist cars in the lapse of 9 months since these cars were last seen in the garden, those changes made are important. Larger intake and exhaust valves have been fitted, both sets being interchangeable. An extra ring has been added to the pistons, bringing the number up to four, all of which are carried above



VIEW OF THE STUDEBAKER MOTOR



TWO VIEWS OF THE CORBIN NEW WATER-COOLED MOTOR

the wrist pin. In the transmission oil retainers are used for the prevention of oil leaking. Road wheels now are 36 inches in diameter, whereas before they were 34 inches. A platform rear spring suspension carries the back part of the frame in which the transverse rear spring supports the frame through a projecting bracket bolted or riveted to the cross member of the frame. The company has added to its line a 60-horsepower four-cylinder car with $5\frac{1}{2}$ by 6-inch cylinders, four-speed and reverse selective transmission with direct drive on the fourth speed—the first time a gearset of this nature has been used by the company. The company has on the road a six-cylinder car in which the cylinders are cast in two sets of threes. The wheelbase measures 132 inches and the wheels carry 36 by $4\frac{1}{2}$ and 5 inch tires.

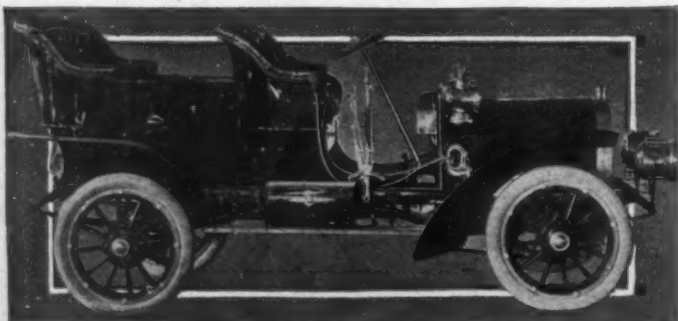
Winton Six Marks Change in Policy

Changing from four-cylinder to six-cylinder construction entirely as done by the Winton company for 1908 is the high water mark in the field of sextette confidence. The new Winton, labeled the Six-Teen-Six, is a 48.6-horsepower car with regular twin-cast cylinders, having valves on the right and improved over previous Winton models by the use of double ignition, a twelve-lead Hancock oiler and a two-jet carbureter. This carbureter is one of the simple creations of the show and consists of an inverted U pipe which sits into the top of the float chamber so the bottom of the U is within the center of the float and below the gasoline level in the float, thus allowing a small basin of gasoline to remain in the lowest part of the U. The air entering through one end of the U passes over the surface of the gasoline and laden with it exits to the motor through the other arm. The carbureter has two jets and two throttles, each located in the lowest part of the U and so interconnected that they open and close progressively. The other motor details may be found on another page in which six-cylinder cars are treated separately. Closely allied with the carbureter system is the 22-gallon gasoline tank under the rear of the chassis in which is carried an emergency 3-gallon tank, the contents of which cannot be used without first signaling the driver, who is thereby warned as to his fuel supply. The motor is fitted with a self-starting device consisting of a cylindrical tank under the chassis filled

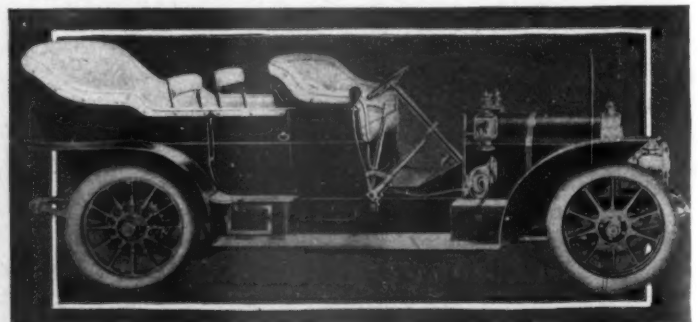
from one of the working cylinders during operations of the motor. In the gas line to this tank is a check valve with a spring equal to the compression so the gas is taken in only under compression. Connecting with the tank is a pipe line that leads to a distributor which has pipes connecting with the combustion chambers of each cylinder and within which is a revolving timed distributor which lets the pressure into each cylinder at its firing point. Should the first-cylinder into which the pressure enters fail to fire, the pressure enters the cylinder next to fire and so on until the motor is in operation. To bring the self-starter into action it is but necessary to operate a valve on the dash. Close to this valve is a pressure gauge showing the gas pressure in the storage tank. In the transmission the disk clutch has had the number of disks increased from forty-nine to sixty-five, increasing thereby the friction surface $33\frac{1}{3}$ per cent. In the selective gearset the four forward speeds are retained, but direct drive is now on the fourth speed. In the 1907 Wintons it was on the third speed. The wheels are 2 inches greater in diameter than any previous wheels used on Wintons. Timken roller bearings are used throughout in the running gear and double brakes are placed on the rear wheel hubs, one set internal, the other external.

Stevens Springs a New Four-Cylinder

Although people expected to find the big and little Stevens-Duryea sixes continued for 1908 in practically their 1907 chassis and body dress, they were very surprised when late Saturday evening, the opening night of the show, a new four-cylinder car was pushed into the booth and which car occupies the place formerly held by the Stevens little four. This new four, a 24-horsepower vehicle with $4\frac{1}{4}$ by $4\frac{1}{2}$ -inch cylinders cast in pairs and with valves in integral parts on the left side, is the first Stevens to use twin cast cylinders. On it the four-feed Lavigne oiler is carried on the motor right under the hood and the motor has a double ignition outfit, a Gianoli magnet on the left rear of the motor base and a storage cell system in reserve, with the timer located on the top of a short vertical shaft at the right of the rear cylinder pair. Two sets of plugs are inserted in the caps over the valves. Following the Stevens practice, the half-time gears are at the rear end of the crankcase and the flywheel located on the forward end of the crank-



STEVENS-DURYEY'S LATEST FOUR-CYLINDER

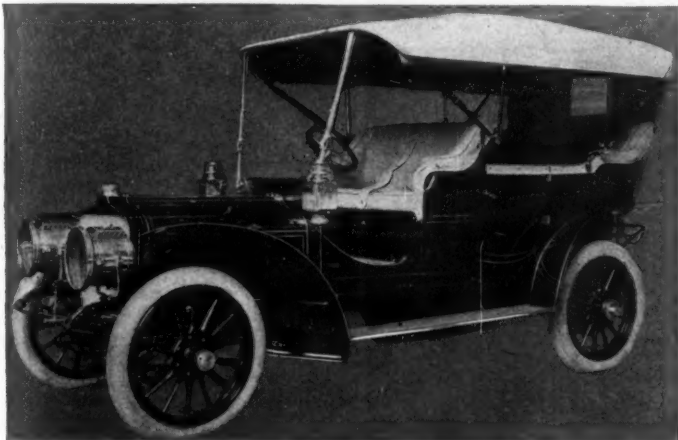


THOMAS FLYER SEATING SEVEN

shaft. New about the motor is a redesigned carbureter on the left, the particulars of which were not obtainable. In the running gear attention is invited to the new style of drive shaft, which is not enclosed as in other Stevens cars and which has a universal joint at its front end and another at its rear end. Also to be looked at is the rear platform spring, which carries the car weight through a curved hanger arching in rear of their frame cross piece. All space between the fenders and running board and the car body is enclosed and in the tonneau is an adjustable bond foot rest, greater in width than the length of the foot and equal in length to the width of the tonneau.

Four Models in the Thomas Flyer Family

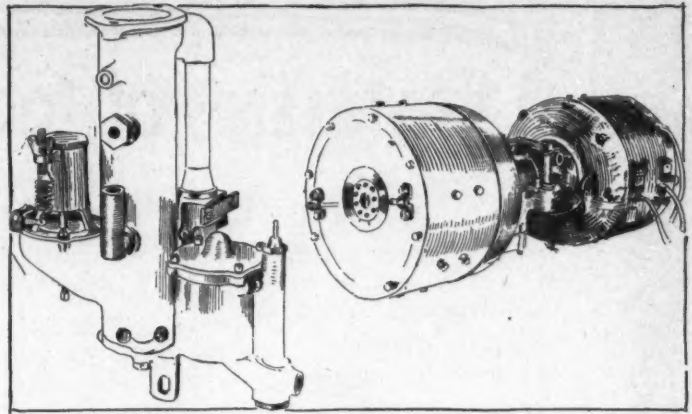
The Thomas Flyers for 1908 are in four models—a six-cylinder touring car described in the six-cylinder story, two different models of the four-cylinder chassis and a town car or motor cab which is given in detail below. The two four-cylinder cars are known as models F and DX, which differ only in a few details. The motors of both are identical in size but are differently hung in the chassis. In model F it is carried on a subframe and in DX it is on four bronze brackets riveted to the frame side members. In both models the frame sides have been increased 1 inch in depth and $\frac{1}{4}$ inch in width, the thickness remaining at 5-32. With this the truss rod, its turnbuckle and two king posts, have been omitted. Grease cups have been added pretty well throughout as is the practice on most cars this year. Two complete ignition systems are furnished—the Atwater-Kent and the Bosch high-tension. The new carbureter has its entire change



SELDEN, ONE OF THE NEW CARS

in the supplemental air valve, which is made up of one cylindrical casting with the lower half of reduced diameter. In the upper part works a cup piston, in the lower half a sliding sleeve barrel, both united by a tubular rod inserted into the cup piston and carrying the sleeve valve. The air piston is lifted by the suction of the motor which tends to create a vacuum in the upper part of the cylinder, which is closed by a screw cap. This motion is resisted by the weight of the cup piston. As this vacuum is produced above the piston air enters beneath the piston through a small opening in the projecting base of the upper part of the cylinder. This upward movement of the piston raises the sliding sleeve in the lower part of the cylinder and uncovers the six ports admitting air. The restricted passage to the under side of the cup piston, combined with the air trapped above the piston, prevents a fluttering which would otherwise give sudden fluctuations in the auxiliary air supply.

The Thomas Detroit for 1908 has its leading change in the motor, departing from a Continental to one manufactured by the American and British Mfg. Co. This motor of notably good construction and finish and of the generally accepted style, with cylinders in pairs and valves on one side. In changing the motor the bore and stroke have been exactly reversed, so now the bore of 5 inches is $\frac{1}{4}$ inch longer than the stroke. The 1907 line, a three-passenger runabout, has been increased by two other models, a five-passenger touring car and a four-passenger tourabout. All three models are on the same chassis, the power

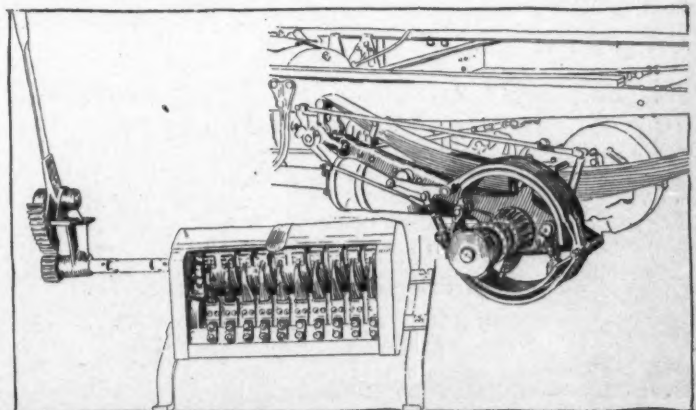


COLUMBIA CARBURETER AND MOTOR GENERATOR

plant in the touring car being further forward than in the other two models and in all the wheelbase has been increased $\frac{1}{2}$ inch.

Columbia Has a Combination Car

Featured in the Columbia space is the combination car with its electric transmission in that its stripped chassis is exhibited for the first time. Also displayed throughout the booth are different models carried on the 28-horsepower chassis with its low-tension ignition. The engine of the combination car is new and easily distinguished by the use of integral valve chambers on the left, with intake valves in the tops of the chambers and opened through overhead rocker arms. The cylinder castings were designed to give a surplus of waterjacket space, and have detachable water plates forming the front and rear face of the castings. Occupying the right side is the two-jet carbureter and on the left the high-tension magneto, water pump, exhaust manifold and distributor carried on a stub vertical shaft rising through the left front motor arm. The distributor-timer is so designed that neither the primary nor secondary winding moves when the spark is varied. Oiling is mechanical from an eight-feed tank on the dash, and the crankshaft is cut from the solid billet and has the cam gear flanged on. The transmission eliminates the entire use of gears except those bevels needed for transferring the drive from the shaft to the back axle. The gasoline engine has its power delivered to the axle not through a continuous driveshaft but through an electric clutch generator and an electric motor, so that speed can be varied as desired. Starting from the motor and traveling rearward first is encountered a barrel-shaped casing in which is the electric clutch generator; next comes a short shaft with a clutch coupling followed by a second barrel-shaped housing containing an electric motor, and lastly is the driveshaft with two universal joints that couples with the back axle. The gasoline engine, when revolving, turns the fields of an electric generator, and within these fields is the generator armature, separated from the fields by an air space, so that there is no mechanical connection between the fields and the armature. As the fields revolve they magnetically pull the armature around with them, and so the motor power is transmitted to the electric motor.



COLUMBIA ELECTRIC CONTROLLER, BRAKE AND STRUT ROD

Statistics of 1907 A.L.A.M. Show

GASOLINE CARS

DETAIL	PLEASURE	COMMERCIAL	TOTAL
Complete cars	128	6	134
Complete chassis	28	2	30
Water-cooled motors	139	4	143
Air-cooled motors	17	4	21
Four-cycle motors	152	8	160
Two-cycle motors	4	..	4
Compound motors .....	..	..	..
Eight-cylinder motors .....	..	..	..
Six-cylinder vertical motors	18	..	18
Four-cylinder vertical motors	126	4	130
Three-cylinder vertical motors.....	2	..	2
Two-cylinder horizontal motors—under body.....	5	..	5
Two-cylinder vertical motors.....	..	4	4
Two-cylinder opposed motors—under bonnet.....	4	..	4
One-cylinder vertical motors.....	1	..	1
One-cylinder horizontal motors.....	..	..	..
Make-and-break ignition	19	..	19
Jump spark ignition.....	137	8	145
Jump spark magneto.....	31	..	31
Jump spark batteries.....	57	..	57
Jump spark dynamo.....	..	..	..
Jump spark double.....	49	..	49
Mixed ignition .....	..	..	..
Sliding gear transmission.....	47	2	49
Selective gear transmission.....	96	1	97
Planetary gear transmission.....	9	4	13
Friction transmission	4	1	5
Side chain drive.....	33	5	38
Single chain drive	3	2	5
Shaft drive	120	1	121
Body—runabout	10	..	10
Body—four-passenger tourabout	10	..	10
Body—three-passenger runabout	13	..	13
Body—five-passenger tourist	27	..	27
Body—seven-passenger tourist	38	..	38
Body—limousine	21	..	21
Body—landaulet	3	..	3
Body—victoria .....	..	..	..
Body—miscellaneous	6	..	6

RECAPITULATION

Complete cars	192
Complete chassis	34
Shaft drive	134
Chain drive	78
Steam cars	5

ELECTRIC CARS

Complete cars	44
Complete chassis	4
Commercial cars	9
Shaft drive	13
Chain drive	35

Statistician Compares Other Shows

	OCT., 1907	JAN., 1907	DEC., 1906	1906		1905	1904
	A. M. C. M. A. PALACE	A. L. A. M. GARDEN	A. M. C. M. A. PALACE	A. L. A. M. GARDEN	A. M. C. M. A. ARMORY	GARDEN	GARDEN
TYPES OF CARS							
Gasoline cars	154	141	177	110	138	207	185
Gasoline trucks	16	..	9	13	11	7	5
Gasoline chassis	35	40	*48	32	39	*37	*34
Electric cars	5	34	5	25	9	20	45
Electric trucks	2	11	2	20	4	9	7
Steam cars	3	..	10	..	9	9	9
*Not included in total count.	215	226	251	200	210	289	285
COOLING METHODS							
Water-cooled	187	157	215	132	171	182	156
Air-cooled	18	24	19	23	17	25	29
	205	181	234	155	188	207	185
TYPES OF MOTORS							
Four-cycle	195	177	227	151	184	203	181
Two-cycle	6	4	2	3	1	2	3
Compound	4	..	5	..	4	2	1
	205	181	234	154	189	207	185
CYLINDERS							
Eight-cylinder	2	1	..	..	..	..	..
Six-cylinder vertical	28	10	8	2	3	2	..
Four-cylinder vertical	132	153	180	137	119	127	82
Three-cylinder	6	2	4	1	7	7	6
Two-cylinder opposed	30	6	32	7	41	39	41
One-cylinder vertical .....	..	2	..	1	..	8	14
One-cylinder horizontal	1	7	2	5	5	9	25
Other forms	6	..	7	2	13	15	17
	205	181	234	155	188	207	185
IGNITION							
Make-and-break	14	40	56	33	42	19	21
Jump spark	191	96	173	113	141	188	158
Both .....	..	45	9	9	5	..	6
	205	181	234	155	188	207	185
CURRENT SUPPLY							
Magneto	25	19	94	39	48	31	..
Batteries	180	117	135	107	128	157	..
Both .....	..	45	5	9	12	19	..
	205	181	234	155	188	207	..

FOREIGN SHOW STATISTICS

OLYMPIA—FALL 1906		PARIS—FALL 1906	
Gasoline cars.....	559	Gasoline cars.....	650
Electric cars.....	6	Electric cars.....	37
Steam cars.....	11	Steam cars.....	2
Total	576	Total	689

There were no commercial cars at Olympia; the Paris count is exclusive of 139 commercial cars; both counts include all sizes of cars—tri-cars, motorettes, racing cars and chassis.

Directory of the Motor Car Exhibitors

- Alden Sampson Mfg. Co., Pittsfield, Mass.**
Road train, three trucks
- Anderson Carriage Co., Detroit, Mich.—Detroit Electric**
One stanhope, one coupe
- Apperson Bros. Mfg. Co., Kokomo, Ind.—Apperson**
One touring car, one jackrabbit, one four-cylinder runabout, one six-cylinder runabout, one English mail coach
- Autocar Co., Ardmore, Pa.—Autocar**
One chassis, one runabout, one roadster, one touring car
- Babcock Electric Carriage Co., Buffalo—Babcock electric**
One special stanhope, one roadster, one victoria-phaeton, one coupe
- Baker Motor Vehicle Co., Cleveland, O.—Baker electric**
One chassis, one roadster, one coupe, one victoria, one landaulet, one police patrol
- Selden Motor Vehicle Co., Despatch, N. Y.—Selden**
Two chassis, two touring cars
- Buick Motor Car Co., Flint, Mich.—Buick**
Two chassis, two touring cars, two runabouts
- Cadillac Motor Car Co., Detroit—Cadillac**
One chassis, two runabouts, three touring cars, one limousine, one delivery wagon, one coupe
- Champion Wagon Co., Owego, N. Y.—Champion**
One light covered delivery wagon
- Corbin Motor Vehicle Corporation, New Britain, Conn.—Corbin**
One water-cooled chassis, one water-cooled touring car, one air-cooled runabout, one four-passenger air-cooled runabout
- Electric Vehicle Co., Hartford, Conn.—Columbia**
Gasoline—One chassis, two touring cars, one runabout, two limousines Electric—One victoria, one victoria-phaeton, one landaulet, one brougham
- Elmore Mfg. Co., Clyde, Ohio—Elmore**
One chassis, one three-cylinder touring car, one four-cylinder touring car, one roadster
- H. H. Franklin Mfg. Co., Syracuse—Franklin**
Two runabouts, three touring cars, one landaulet, one two-passenger taximeter cab, one 1-ton truck
- General Vehicle Co., Long Island City, N. Y.**
One victoria, one runabout, one roadster, one landaulet, one delivery wagon, two trucks
- Haynes Automobile Co., Kokomo, Ind.—Haynes**
Three touring cars, two runabouts
- Hewitt Motor Co., New York**
One seven-passenger omnibus, one single-cylinder delivery wagon, one four-cylinder truck, one chassis, four-cylinder
- Knox Automobile Co., Springfield, Mass.—Knox**
One water-cooled chassis, one water-cooled touring car, four-passenger, one five-passenger touring car, one seven-passenger touring car, one landaulet, one runabout
- Locomobile Co. of America, Bridgeport, Conn.—Locomobile**
One chassis, two touring cars, one runabout, one limousine, one landaulet
- Lozier Motor Co., New York—Lozier**
One chassis, one four-cylinder touring car, one six-cylinder touring car, one limousine
- Matheson Motor-Car Co., Wilkesbarre, Pa.—Matheson**
One chassis, two touring cars, one limousine, one demi-limousine, all seven-passenger rigs
- Northern Motor Car Co., Detroit—Northern**
One chassis, one roadster, one touring car, one limousine
- Olds Motor Works, Lansing, Mich.—Oldsmobile**
Two four-cylinder touring cars, one six-cylinder seven-passenger touring car, one chassis, one runabout, one landaulet
- Packard Motor Car Co., Detroit—Packard**
One chassis, one touring car, one runabout, one limousine, one delivery wagon
- Peerless Motor Car Co., Cleveland—Peerless**
One chassis, one roadster, one limousine, one four-cylinder touring car, one six-cylinder touring car, six-cylinder motor
- George N. Pierce Co., Buffalo—Great Arrow**
One touring car, one limousine touring car, one chassis and one six-cylinder-40-horsepower touring car, one six-cylinder-60-horsepower touring car
- Pope Mfg. Co., Hartford, Conn.—Pope-Hartford**
One runabout, three touring cars, one limousine
- Pope Mfg. Co., Hagerstown, Md.—Pope-Tribune**
One touring car, one runabout
- Pope Motor Car Co., Toledo, O.—Pope-Toledo**
Two touring cars, one runabout, one limousine, one coach
- Pope Motor Car Co., Indianapolis—Pope-Waverley electric**
One surrey, one stanhope, two runabouts, two coupes, two victorias Commercial—one 1,200-pound delivery wagon, one 1,200-pound truck, one 1-ton truck
- Rauch & Lang Carriage Co., Cleveland—R. & L. electric**
One chassis, one coupe, one stanhope, one landaulet
- Royal Motor Car Co., Cleveland—Royal Tourist**
One chassis, one touring car, one limousine
- Selden Motor Vehicle Co., Despatch, N. Y.—Selden**
- Simplex Motor Co., Mishawaka, Ind.—Simplex**
One chassis, one touring car
- F. B. Stearns Co., Cleveland—Stearns**
One four-cylinder chassis, two touring cars, one four-passenger roadster, one four-passenger six-cylinder roadster
- Stevens-Duryea Co., Chicopee Falls, Mass.—Stevens-Duryea**
One touring car, one limousine, one big six touring car, one chassis, one touring car and one light six limousine
- Studebaker Automobile Co., South Bend, Ind.—Studebaker**
Gasoline—One chassis, one runabout, two touring cars, one limousine Electric—Two stanhopes, one victoria, one omnibus Commercial—One chassis, one delivery, one truck
- E. R. Thomas Motor Co., Buffalo—Thomas-Buffalo**
One chassis, one touring car, one landaulet, one limousine, one livery carriage, two broughams, one six-cylinder touring car
- E. R. Thomas Motor Co., Detroit—Thomas-Detroit**
One chassis, one touring car, one runabout, one tourabout
- Walter Automobile Co., Trenton, N. J.—Walter**
One chassis, one runabout, one tourabout, one landaulet, one limousine
- Waltham Mfg. Co., Waltham, Mass.—Waltham-Orient**
Four runabouts, one roadster, one democrat wagon
- White Co., Cleveland—White**
One runabout, one landaulet, two touring cars, two limousines
- Winton Motor Carriage Co., Cleveland—Winton**
One runabout, one touring car, one limousine
- Woods Motor Co., Chicago—Wood electric**
One coupe, one victoria, one queen victoria

ACCESSORIES

- Acetylene Specialty Co., Jersey City, N. J.**
Stereo acetylene gas tanks; metal welding
- Acetyvone Co., Niagara Falls, N. Y.**
Acetyvone acetylene generators and especially prepared carbide
- Acme Spring Check Co., New York**
Shocksorber shock absorber
- Ajax-Grieb Rubber Co., New York**
Ajax clincher and detachable tires
- Allen Auto Specialty Co., New York**
Tire covers, tire holders and tire locks
- H. A. Allers & Co., New York**
Solarine metal polish
- Aluminum Solder and Refining Co., Oswego, N. Y.**
Aluminum solder
- American Aluminum Coating Co., Connelville, Pa.**
Hoods, tool boxes, battery boxes, and mud-guards of aluminum coated sheets
- American and British Mfg. Co., Bridgeport, Conn.**
Herreschoff motor car and marine engines, pressed steel frames and parts, and drop forgings
- American Ball Bearing Co., Cleveland, O.**
Complete axle equipments

Directory of the Accessories Exhibitors

- American Electric Novelty and Mfg. Co., New York
Every Ready dry batteries
- American Motor Co., Brockton, Mass.
Marsh-Metz motor cycles
- Atwater-Kent Mfg. Works, Philadelphia
Atwater-Kent spark generators
- Aurora Automatic Machine Co., Aurora, Ill.
Thor motor car engines
- Auto Accessories Mfg. Co., Detroit
Bodies, tops, wind shields and tire-covers
- Autocoll Co., Jersey City, N. J.
Autocoll spark coils
- Auto Improvement Co., New York
Ever Ready starters, tire tools, spark plugs, speedometers, and vulcanizers
- Automobile Utilities Co., Boston
Shaw self-sealing inner tubes
- Auto Pump Co., Springville, N. Y.
Spencer tank gauges and power air pumps
- Auto Supply Mfg. Co., Brooklyn
Nonpareil horns
- Avery Portable Lighting Co., Milwaukee, Wis.
Auto-gas gas tanks
- A. Z. Co., New York
Radiators, hoods, tanks, mud-guards, and sheet metal specialties
- Badger Brass Mfg. Co., Kenosha, Wis.
Solar acetylene head and side lights; Solar acetylene generators
- Baldwin Chain and Mfg. Co., Worcester, Mass.
Baldwin motor car chains and bicycle chains
- F. A. Baker & Co., New York
Indian motor cycles and supplies
- E. M. Benford, Mt. Vernon, N. Y.
Benford's spark plugs
- Bethlehem Steel Co., Bethlehem, Pa.
Motor car frames and forgings of levers, crankshafts, etc.; gears made of Bethlehem special gear steel and tools made of Bethlehem special high speed tool steel
- Blue Ribbon Auto and Carriage Co., Bridgeport, Conn.
Motor car bodies
- Robert Bosch, New York
Bosch magnetos
- S. F. Bowser & Co., Fort Wayne, Ind.
Bowser gasoline pumps, tanks, wheel tanks, and lubricating oil cabinets
- Brennan Mfg. Co., Syracuse, N. Y.
Brennan Standard motors
- J. S. Bretz Co., New York
F. & S. ball bearings and Unterberg & Helmle magnetos
- Briscoe Mfg. Co., Detroit
Briscoe radiators, fenders, dashes, mud-guards, hoods, etc
- Brown-Lipe Gear Co., Syracuse, N. Y.
Transmissions, differentials, and steering gears
- Byrne-Kingston Co., Kokomo, Ind.
Kingston carbureters
- Carpenter Steel Co., Reading, Pa.
Forgings of alloy steels; apparatus for testing strength of materials
- Albert Champion Co., Boston
Glanoli magnetos, Champion spark plugs, and Champion wire
- Chandler Co., Springfield, Mass.
Name-plates, stamps, letters, and figures
- L. C. Chase & Co., Boston
Leather for tops and upholstery
- Clover Mfg. Co., New York
Clover grinding compound
- Coes' Wrench Co., Worcester, Mass.
Wrenches of all sizes
- Columbia Lubricant Co., New York
Monogram lubricating oils
- Columbia Nut and Bolt Co., Bridgeport, Conn.
Columbia lock nuts
- Comstock Shock Absorber Co., New York
Comstock shock absorbers
- Consolidated Mfg. Co., Toledo, O.
Yale-California motor cycles
- Connecticut Telephone and Electric Co., Meriden, Conn.
Connecticut coils, timers, switches, voltmeters, and trouble finders
- Continental Caoutchouc Co., New York
Continental tires and Vinet dismountable rims
- Consolidated Rubber Tire Co., New York
Kelley-Springfield pneumatic tires
- Adam Cook's Sons, New York
Albany grease for motor cars and trucks
- Cook's Standard Tool Co., Kalamazoo, Mich.
Standard motor car jacks
- C. Cowles & Co., New Haven, Conn.
Annunciators, dome lights, electric limousine lights, locking handles and leather cases
- Wm. Cramp and Sons' Ship and Engine Building Co., Philadelphia
Parsons' manganese bronze castings and Parsons' white brass bearing metals
- G. H. Curtiss Mfg. Co., Hammondsport, N. Y.
One, two and eight-cylinder motor cycles
- Dayton Electrical Mfg. Co., Dayton, O.
Apple ignition and lighting apparatus, dynamos and storage batteries; Apple automatic switch-boards
- R. E. Dietz Co., New York
Dietz lamps
- Delta Mfg. Co., Bloomfield, N. J.
Delta batteries and Delta spark plugs
- J. E. Demar, New York
Crescent removable rims
- Diamond Chain and Mfg. Co., Indianapolis
Diamond chains and Diamond I-beam axles
- Diamond Rubber Co., Akron, O.
Diamond tires, Diamond detachable rims, Marsh rims and wire mesh base solid tire
- R. E. Dietz Co.
Dietz head and side lights
- Joseph Dixon Crucible Co., Jersey City, N. J.
Graphite motor car lubricants
- Charles J. Downing, New York
Husk motor chimes, Genesee clincher tire and American lamps
- Dow Tire Co., Brooklyn
Dow inner tubes
- William J. Duane Co., New York
Vultz wind shields, Schildbach wind shields and Beecher wind shields
- Ed. Dubled & Co., Paris
Rivets, washers, valves, etc., for tires; Edco sparking plugs
- Duff Mfg. Co., Allegheny, Pa.
Barrett motor car jacks
- E. & M. D. Co., Asbury Park, N. J.
Hickley alternating rectifiers and Hilko specialties
- Eastern Carbon Works, Jersey City, N. J.
Eastern dry batteries
- Edmunds & Jones Mfg. Co., Detroit
Motor car and marine lamps and launch whistles
- Electric Storage Battery Co., Philadelphia
Exide storage batteries
- Empire Auto Tire Co., Trenton, N. J.
Empire pneumatic tires
- Empire State Tire Co., Buffalo, N. Y.
Extensible tread pneumatic tires, Puncture Proof protectors, Greenwald non-skid tread, and sectional vulcanizer
- English & Mersick Co., New Haven, Conn.
Motor car and limousine mountings and fittings; lamps and motor car hardware
- Excelsior Motor and Mfg. Co., Chicago
Excelsior and Triumph motor cycles
- Firestone Tire and Rubber Co., Akron, O.
Firestone pneumatic and solid tires
- Fisk Rubber Co., Chicopee Falls, Mass.
Fisk tires and mechanical rims
- Gabriel Horn Mfg. Co., Cleveland, O.
Gabriel horns and Gabriel shock absorbers
- Garvin Machine Co., New York
Vertical spindle milling machines
- Gelszler Bros., New York
Gelszler storage batteries
- Gemmer Mfg. Co., Wabash, Ind.
Gemmer steering gears

Directory of the Accessories Exhibitors

- Gilbert Mfg. Co., New Haven, Conn.**
Tools, tire irons, tire cases, leather goods, rubber goods and accessories
- G & J Tire Co., Indianapolis**
G & J tires, Midgley rims and sundries
- Glaenger & Co., New York and Paris**
Nieuport magnetos, plugs and coils
- Globe Machine and Stamping Co., Cleveland, O.**
Pressed steel parts, tanks, tool boxes, etc.
- B. F. Goodrich Co., New York**
Goodrich tires
- Goodyear Tire and Rubber Co., Akron, O.**
Goodyear tires and Goodyear universal rims
- Gould Storage Battery Co., New York**
Gould storage batteries for ignition and power
- Gray & Davis, Amesbury, Mass.**
Gray & Davis lamps and Gray & Davis acetylene generators
- Gray-Hawley Mfg. Co., Detroit**
Gray mufflers, Autochime horns, cut-outs and steam and air whistles
- C. T. Ham Mfg. Co., Rochester, N. Y.**
Ham's cold blast lamps
- Hancock Mfg. Co., Charlotte, Mich.**
Hancock oilers, tank gauges, hand rails, foot rails, monograms, name plates, brass pipe fittings, etc.
- Edmond E. Hans Co., Minneapolis, Minn.**
Hans' indicator
- R. E. Hardy Co., New York**
Sta-Rite mica and porcelain spark plugs
- A. W. Harris Oil Co., Providence, R. I.**
Harris oils, greases, polishes and transmission compounds
- Hartford Auto Parts Co., Hartford, Conn.**
Parts for universal joints
- Hartford Rubber Works Co., Hartford, Conn.**
Hartford tires and Dunlop tires
- Hartford Suspension Co., New York**
Truffault-Hartford shock absorber
- Havoline Oil Co., New York**
Havoline motor oils
- Healey Leather Tire Co., New York**
Healey leather tires
- Heinze Electrical Co., Lowell, Mass.**
Heinze spark coils and Heinze magnetos
- Hendee Mfg. Co., Springfield, Mass.**
Indian motor cycles
- Herz & Co., New York**
Herz timers and ignition apparatus
- Hess-Bright Mfg. Co., Philadelphia**
Hess-Bright ball bearings
- Hicks Speed Indicator Co., Brooklyn**
Hicks speed indicator
- Hoffecker Co., Boston**
Hoffecker speedometers
- Holley Brothers Co., Detroit**
Holley carbureters and Holley magnetos
- Hopewell Brothers, Cambridge, Mass.**
Tire cases, robes, tool rolls, etc.
- Hotchkiss Mfg. Co., Chicago**
Hotchkiss anti-jolt device
- Hyatt Roller Bearing Co., Newark, N. J.**
Hyatt roller bearings
- Indestructible Steel Wheel Co., Chicago**
Indestructible steel wheels for motor cars
- Janney-Steinmetz Co., Philadelphia**
Janney-Steinmetz gas and pressure tanks and flash-light spark plugs
- Jeffery-DeWitt Co., Newark, N. J.**
Reliance spark plug
- Isaac G. Johnson & Co., Spuyten Duyvil, N. Y.**
Automobile parts, castings and I-beam axles
- Phineas Jones & Co., Newark, N. J.**
Motor car artillery wheels
- Kilgore Mfg. Co., Oldtown, Me.**
Kilgore shock eliminator
- Jones Speedometer Co., New York**
Jones speedometer and Chelsea clocks
- Julius King Optical Co., New York**
Goggles, goggles and accessories
- Kitsee Storage Battery Co., Wilkes-Barre, Pa.**
Kitsee storage batteries
- Lavalette & Co., New York**
Elsemann-Lavalette magnetos, R. B. F. ball bearings, Malicet & Blin differentials, transmissions and steering gears, and Lemoine axles and springs
- Leather Tire Goods Co., Newton Upper Falls, Mass.**
Woodworth treads and Woodworth tires
- Light Mfg. and Foundry Co., Pottstown, Pa.**
Aluminum, brass and bronze castings, and Light motor cycles
- Lipman Mfg. Co., Beloit, Wis.**
Lipman electric speed indicators, Lipman electric dash odometers, rotary pumps, timers, and dash-board tank gauges
- Livingston Radiator Co., New York**
Livingston radiators
- Loring Auto Appliance Co., New York**
Loring speed gauge
- Manufacturer's Foundry Co., Waterbury, Conn.**
Cylinder castings
- Manhattan Screw and Stamping Works, New York**
Phoebus acetylene lamps and accessories
- Manhattan Top & Body Co., New York**
Motor car tops, wind shields and trunks
- Leon Mann Co., New York**
Motor car clothing
- John W. Masury & Sons, New York**
Motor car paints and varnishes
- Merchant & Evans Co., Philadelphia**
Hele-Shaw clutches, Evans change-speed gears, Star metal tire cases, and imported axles
- Michelin Tire Co., Millton, N. J.**
Michelin tires and Michelin removable rim
- Merkel Motor Co., Milwaukee, Wis.**
Merkel motor cycles
- Midgley Mfg. Co., Columbus, O.**
Midgley pressed steel wheels and Midgley detachable rims
- Charles E. Miller, New York**
Miller speedometers, Miller spark plugs, chains and accessories
- William P. Miller's Sons, Long Island City, N. Y.**
Pan-o-lite oil, Excelsior cylinder oils, Excelsior fibrous oils, and Miller's grease
- Morgan & Wright, Detroit**
Morgan & Wright tires and Morgan & Wright-Midgley rims
- A. R. Mosler & Co., New York**
Split Fire spark plugs
- Motor Car Specialty Co., Philadelphia**
Lea speedistometer, Phelps vehicle recorder, and Boss filter
- Motsinger Device Mfg. Co., Pendleton, Ind.**
Ignition devices
- Motz Clincher Tire and Rubber Co., New York**
Motz solid and cushion tires
- Muncie Auto Parts Co., Muncie, Ind.**
Transmissions, cone clutches, control levers, and steering gears
- L. J. Muttly Co., Boston**
Top fabrics and waterproof robes
- Nathan Novelty Co., New York**
Tire covers, coat rail bags, motor trunks, motor leggings, and Carryall tire trunks
- National Battery Co., New York**
National storage batteries
- National Carbon Co., New York**
Columbia igniters, coils, timers, etc.
- National Oil Pump and Tank Co., Dayton, O.**
National oil pumps; National gasoline storage tanks and pumps
- National Oil and Supply Co., Newark, N. J.**
Viscous oils
- National Sales Corporation, New York**
Conover wind shields, Royal batteries, Multiplex lamps, Pirelli tires, and Peugeot chains

Directory of the Accessories Exhibitors

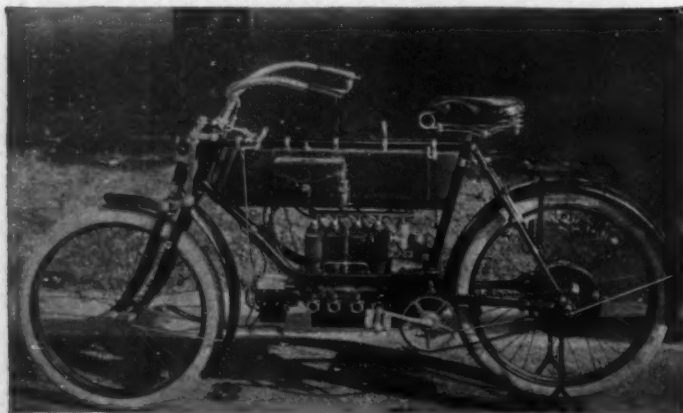
- New Departure Mfg. Co., Bristol, Conn.**
Annular ball bearings, bicycle coaster brakes, automatic bells, and bicycle and motor cycle brakes and hubs
- Newmastic Tire Co., New York**
Newmastic tire filling and Parker rims
- New York and New Jersey Lubricant Co., New York**
Non-fluid oils and motor car cylinder oils
- New York Sporting Goods Co., New York**
Special lamp sets, Pittsfield coils, and French Dragon horns
- Noera Mfg. Co., Waterbury, Conn.**
Motor car pumps, oilers, oil guns, etc.
- Norris Auto Co., Saginaw, Mich.**
Standard tire protector
- Norton Co., New York, and Norton Grinding Co., New York**
Alundum grinding wheels and ground crank shafts; grinding machine in operation
- N. S. U. Cycle and Motor Co., New York**
N. S. U. motor cycles
- Oliver Mfg. Co., Chicago**
Peerless jacks
- Ovington Motor Co., New York**
F. M. motor cycles and parts
- Pacific Iron Works, Bridgeport, Conn.**
Four-cylinder motor car engines
- Pantasote Co., New York**
Pantasote upholsterings, tops and coverings
- Patterson, Gottfried & Hunter, New York**
Empire repair kit, Elite repair kit, P. G. & H. bearing scrapers, Yemco quick acting wrench, and Victor belt couplings
- Peerless Igniter Mfg. Co., Brooklyn**
Peerless dry batteries
- Pennsylvania Rubber Co., Jeanette, Pa.**
Pennsylvania pneumatic tires
- Perfection Spring Co., Cleveland, O.**
Perfection springs
- Pierson Motor Supply Co., New York**
Puritan gas tanks, Standard carbonic tire tanks, and Weiss-Underhill speed indicators
- Pittsfield Spark Coil Co., Dalton, Mass.**
Pittsfield spark coils, magnetos, spark plugs, timers, switches, etc.
- Post & Lester Co., Hartford, Conn.**
Royal lamps and igniters, Bolier horns, Accuro voltmeters, M. & M. cement, luminous clocks, tire cases, etc.
- Prest-O-Lite Co., New York**
Prest-O-Lite gas tanks and air tanks
- Precision Appliance Co., Chicago**
Precision oilers
- Thomas Prosser & Son, New York**
Krupp steel gears, crankshafts, axles, etc.
- Randall-Faichney Co., Boston**
B-line oil and grease guns, B-line auxiliary dash feed pump and Webster gasoline gauge
- Rands Mfg. Co., Detroit**
Tops, wind shields, lamp brackets, etc.
- Reading Standard Co., Reading, Pa.**
Reading Standard motor cycles
- P. Rielly & Son, Newark, N. J.**
Leather for motor car upholstery
- Remy Electric Co., Anderson, Ind.**
Remy high tension alternating current magnetos
- Republic Rubber Co., Youngstown, O.**
Republic tires and Republic detachable and clincher rims
- William C. Robinson & Son Co., Baltimore, Md.**
Autoline lubricating oils and greases
- Rose Mfg. Co., Philadelphia**
Neverout acetylene lamps, and Neverout acetylene generators
- Royal Motor Works, Worcester, Mass.**
Royal motor cycles
- Rushmore Dynamo Works, Plainfield, N. J.**
Rushmore electric and acetylene head and search lights, and acetylene generators
- J. H. Sager Co., Rochester, N. Y.**
Sager flexible spring, Sager equalizing spring and Sager cushion forks for motor cycles
- Saxon Lamp Co., New York**
Saxon acetylene lamps and Saxon acetylene generators; motor car annunciators
- Schwartz Wheel Co., Philadelphia**
Motor car artillery wheels
- C. A. Shaler Co., Waupun, Wis.**
Shaler electric vulcanizer
- Shelby Steel Co., Pittsburg**
Seamless steel tubing
- Sherwin-Williams Co., Cleveland, O.**
Motor car colors, varnishes and fillers
- Amos Shirley, New York**
Styria, Indian and Reading Standard motor cycles
- S. Smith & Son, New York**
Smith's Perfect speed indicators, Crack electric horns and Coventry chains
- R. H. Smith Mfg. Co., Springfield, Mass.**
Springfield motometers
- Spicer Universal Joint Mfg. Co., Plainfield, N. J.**
Spicer universal joints
- C. F. Splittdorf, New York**
Splittdorf magnetos, coils, timers, etc.
- Sprague Umbrella Co., Newark, N. J.**
Sprague's tops and wind shields
- Springfield Metal Body Co., Springfield, Mass.**
Metal bodies and tops
- Stackpole Battery Co., St. Mary, Pa.**
Autocrat and Radium dry batteries
- Standard Roller Bearing Co., Philadelphia**
Standard transmission axles, Standard roller bearings and Standard annular ball bearings
- Standard Welding Co., Cleveland, O.**
Rims and tubes
- John T. Stanley, New York**
Mobo auto cleanser and Shofo hand cleanser
- Stewart & Clark Mfg. Co., Chicago**
Stewart speedometer and American speedometer
- Swinehart Clincher Tire and Rubber Co., Akron, O.**
Swinehart pneumatic tires, twin solid tires and cellular tires
- Tavernier & Quenzin, Paris**
Chrome leather for anti-skid tires
- Timken Roller Bearing Axle Co., Canton, O.**
Timken roller bearings, rear axles, differentials, etc.
- Traver Blowout Patch Co., New York**
Traver blowout patch
- Troy Carriage Sunshade Co., Troy, O.**
Troy motor car front
- Turner Brass Works, Sycamore, Ill.**
Name plates, whistles, brass fittings, etc.
- Uncas Specialty Co., Norwich, Conn.**
Timers, siren horns, gasoline separators, distributors, and ignition devices
- U. S. McAdamite Metal Co., Brooklyn**
McAdamite metal castings
- Vacuum Oil Co., Rochester, N. Y.**
Vacuum Mobile oils for motor car engines and motors
- Valentine & Co., New York**
Valentine's coach and car varnishes and colors
- Veeder Mfg. Co., Hartford, Conn.**
Veeder tachodometers
- Ventilated Cushion and Spring Co., Jackson, Mich.**
Rough Rider springs and ventilated buttons
- Vesta Accumulator Co., Chicago**
Vesta storage batteries, electric lamps, electric horns, and annunciators
- Victor Shock Absorber Co., New York**
Victor shock absorbers
- Vorhees Rubber Mfg. Co., Jersey City, N. J.**
Friction and gum for vulcanizers
- Warner Gear Co., Muncie, Ind.**
Transmissions, differentials and steering gears
- Warner Instrument Co., Beloit, Wis.**
Warner autometer, Warner cutmeter, Warner railway speedometer, and Warner anemometer
- Watres Mfg. Co., New York**
Watres air whistles
- Webb Mfg. Co., Newark, N. J.**
Webb flexible shafts for speedometers
- Western Electric Co., Chicago**
W. E. synchronized ignition system, the 1900 dry batteries and Recti bells
- Weed Chain Tire Grip Co., New York**
Weed chain tire grips
- Wheeler & Schebler, Indianapolis**
Schebler carbureters
- Whitlock Coil Pipe Co., Hartford, Conn.**
Whitlock radiators, motor connections and bent pipes
- Witherbee Igniter Co., New York**
Witherbee storage batteries, Wico specialties, spark plugs, timers, etc.
- Wray Pump and Register Co., Rochester, N. Y.**
Wray power and hand pumps and Wray registers
- O. W. Young, Newark, N. J.**
Young's lubricating oils and Young's graphite greases

M Motor Cycles Show Improvements

THAT a motor cycle department is a very interesting and valuable adjunct to the show is evidenced very strongly at this time. In numbers of exhibitors, class of exhibits, and enthusiasm of the public it compares very favorably with its big parent, the motor car. At no previous exhibition has such a satisfactory showing been made and it proves that if the management had provided a suitable location and if it had not scattered the exhibits that the motor cycle department would be an important one. As proof that designers have kept pace with the procession an examination of the 1908 models is enough to convince the skeptics. These models are of all kinds and descriptions, including the single wheel, tandem, tri-car, delivery van, and tri-cars with auxiliary seats. The power plants of these models are of the single, double, four and eight-cylinder type, and show such modern improvements as mechanical intake valves operated by the same cam as the exhaust, magnetos, sight feed lubricators, Schebler carbureters, Hess-Bright ball bearings on the crankshaft, and in one model roller bearings are used for both crankshaft and crank pin bearings. There is a decided tendency toward an increase of power and friction-eliminating devices. In frame design the trend is toward lower seats, slightly increased wheel base, grip control, long handle bars, spring forks, lowering of battery boxes, tool compartments and a general refinement.

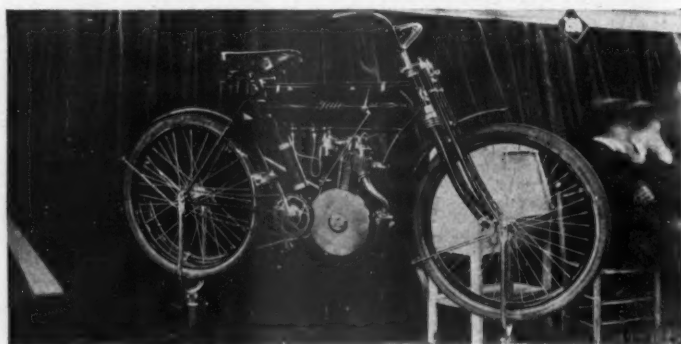
There are two exhibits of motor cycle supplies, by F. A. Baker & Co. and the Ovington Motor Co., who show everything essential for a cyclist's convenience, from leggings to goggles, and from speedometers to acetylene lamps with separate generators. The American Motor Co. is exhibiting the Marsh-Metz models. These are of the single-cylinder type with a motor of the company's own build, which forms a continuation of the seat post part of the frame. It is belt-driven without an idler, having instead an idler on the chain. The belt is of the wide flat type and is kept tight by very long rear adjusting jaws.

A double float carbureter is a feature of the Reading Standard motor cycle. The object of the design is to avoid centrifugal action on the fuel by having the mixing chamber between the two float chambers. The motors are of the one and two-cylinder type, the double cylinder being set at an angle of 47 degrees with valve chambers on opposite sides so the heat from the forward cylinder does not strike and heat up the rear. These motors have mechanical intake valves and are well made.



BIG FOUR F.N., FROM BELGIUM

It might be said that the motor cycles are divided into two classes, the domestic and foreign. While the foreigners run to multi-cylinder motors and show beautiful design and workmanship it would seem as if the control levers, adjustments and operating devices would tend to scare a novice. This is the reverse of the domestic policy, which aims at simplicity and fool-proof design. The F. N. four-cylinder and Baby motor cycles share with the Peugeot and Styria the honors of the foreign section, and well they merit the attention. The four-cylinder F. N., with its shaft-drive, Simms-Bosch magneto, band brakes, fine workmanship and finish of detail is constantly surrounded by a crowd of admirers. As showing the confidence of prompt delivery by the Ovington Motor Co. a contract is entered into with the purchaser with a 5 per cent forfeit clause



YALE-CALIFORNIA MOTOR CYCLE FOR 1908

should the delivery not be ready at the specified time. At this exhibit are also seen the Ever Ready tire tool made in motor cycle size and a siren horn, speedometer, separate generator and acetylene lamps, made for the two-wheelers. At the space occupied by N. S. U. motor cycles, which seem to be an English product, are seen a two-passenger tri-car with a two-speed planetary gear in the rear hub. This model is fitted with band and friction brakes, the brakes working in the pulley flange. The magneto is spur gear driven through the medium of two idler gears. This tri-car is richly upholstered in baby blue leather and is the magnet that draws a crowd. The Peugeot is another example of French design which is being sold by the National Sales Corporation.

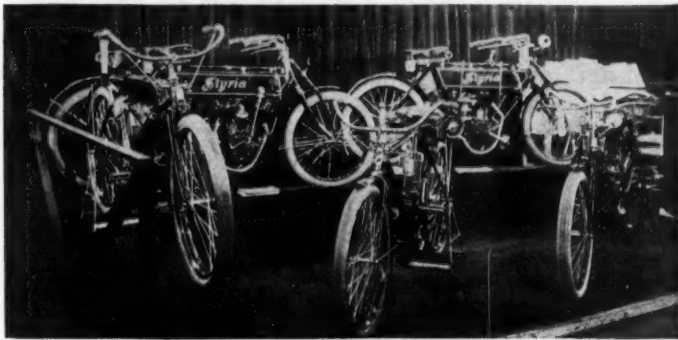
From Chicago comes the Excelsior and Triumph exhibit. The Excelsior is the feature of this space and is a good example of the single-cylinder type. In the construction of this model, which has a home-built motor $3\frac{1}{2}$ by $3\frac{1}{2}$ inches, said to develop $3\frac{1}{4}$ horsepower, there is noticeable a decided attention to small details, among which are the crankcase breathing hole through the crankshaft, avoiding the discharge of oil. The large filling holes in the gasoline tank are fitted with gauze strainers. There is an adjustable gravity-fed lubricator and a very good sized metal tool box, which is placed between the rear mud guard and saddle post of the two-wheeler.

The Yale-California presents a few features exclusive to itself. This cycle is the only one to display an exposed flywheel, which is at the right side of the crankcase. The compression release on this motor is by means of the intake valve instead of the exhaust, as is usual. To an observer this looks like a good move,

permitting cool air to enter the cylinder, cleaning and cooling it while coasting. Sager front forks, greatly strengthened, are manufactured and controlled by the Yale-California makers. This model shows very few changes except in minor detail from last season, the builders devoting their energy to refinement of design in frame and motor construction. One of the up-to-date advances in motor design is the adoption of Hess-Bright bearings for the crankshaft, which is a feature used by the Merkel Motor Co. This concern has adopted also a rear spring frame, which serves to aid the saddle springs in protecting the rider from road shocks and jars. Another Merkel stunt is the double-stem handle bar. Should the clamp nut become loosened there is no danger of the bar shifting. This motor has adopted the practice of placing the throttle in the cylinder head around the intake valve. This is in line with the most modern motor theory.

An interesting exhibit in point of numbers and variety of models is in the Indian booth of the Hendee Mfg. Co. Here are single and double-cylinder roadsters, tri-cars, delivery vans and two-passenger tri-cars. The Indian is the only motor cycle shown to employ a fan to assist in cooling. This is an option and is spring belt-driven.

An enthusiast finds time pass quickly while at the booth of Amos Shirley, where the Styria, an Austrian product, is seen for the first time. This is the only example of two-speed motor cycle shown here. This two-speed gear is planetary and is located in the hub of the rear wheel. The motor has mechanical valves and the magneto, driven by a bevel gear, is located in a compartment of the tank where it is kept dry and clean.

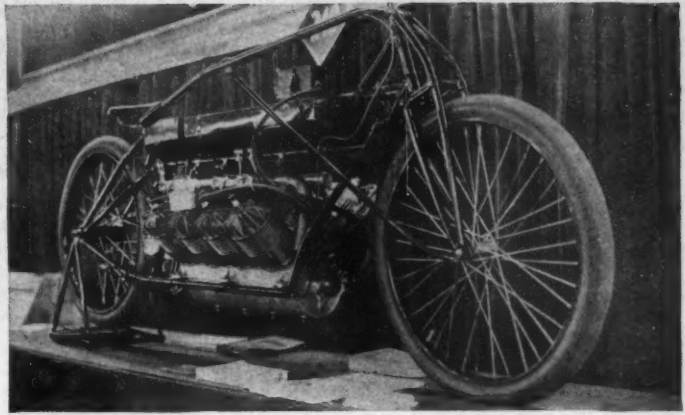


STYRIA EXHIBIT, ALL FROM AUSTRIA

This cycle is chain-driven and has a wheel base of 59 inches.

The rate of 135 miles an hour, or a mile in 26 $\frac{1}{2}$ seconds, is very fast traveling, but no one is surprised when shown the eight-cylinder Curtiss, which is credited with having performed this feat. The cylinders are in two sets of four each, placed obliquely on the crankcase. The cycle is shaft-driven with a universal joint in the driving shaft. Ignition by a vibrating coil and distributor. Two carbureters are used.

The exhibit of the Light Mfg. and Foundry Co. shows motor cycles equipped with Thor motors of 2 $\frac{1}{4}$, 3 and 5 rated horsepower, chain driven, 55-inch wheel base, and spring fork op-

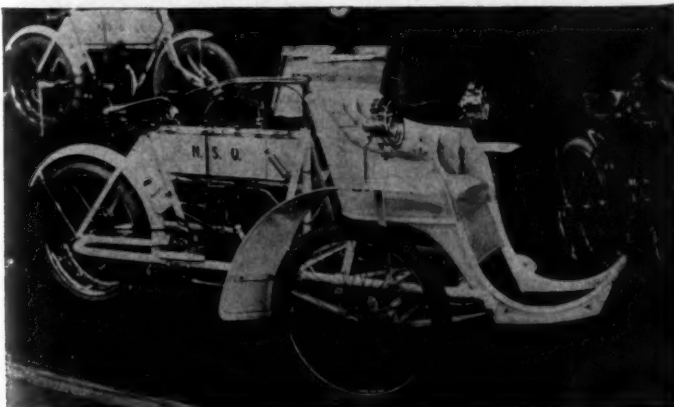


EIGHT-CYLINDER CURTISS, A SPEEDY TWO-WHEELER

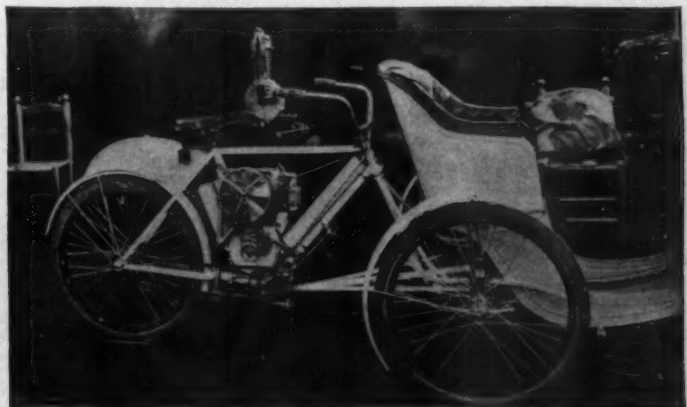
tional. One very meritorious device peculiar to this machine is the battery box, which is the lower part of the structure, also containing the gasoline and oil tanks.

A decided novelty in the motor cycle exhibit is what is said to be the first motor cycle built in America, which traveled 100 miles all at one time. This is an old safety equipped with a motor and chain-driven. It is on exhibition in the booth of the Royal Motor Works.

Motor cycle tires are of as many different makes as there are tire manufacturers, and are usually 2 $\frac{1}{4}$ to 2 $\frac{1}{2}$ inches in diameter. The Healy Tire Co. is showing a motor cycle tire with its chrome tan leather covering. In belts there is a variety of constructions, from the flat wide rawhide and gauze construction to the foreign type of V-belt made with 30 degree sides. Rubber V belts with corrugated surface are seen on the N. S. U. models. The belt of the Curtiss motor cycle is V-shaped with spaces through the center to aid flexibility. There are diverse opinions among the manufacturers as to the best type of drive, chain or belt. The chain adherents maintain that the chain is more positive, less affected by the weather and easy to repair. They overcome the motor strain on the spokes by means of a compensating clutch. The belt people say that their device is best because it is not so positive, that a motor cycle will make heavier grades by allowing the belt to slip, using the belt practically as a low gear. Some use positive idlers for belt tension, others spring and in one case no idler is used. The advancement of motor cycle construction is apparent in the fact that nearly all makers will equip with magneto ignition for \$40 extra. No radical changes are seen. The practice of expecting a motor cycle rider to stop frequently for lubrication is eliminated by many makers by the adoption of measuring guns, or sightfeed lubrication to replace the used oil. There is a slight tendency toward smaller wheels, though that is usually optional. Most of the makers build their own motors, though some use the Thor engine, which is shown at the exhibit of the Aurora Automatic Machinery Co., which has a motor cycle built up from parts manufactured by the concern.



MODEL OF THE INDIAN TRI-CAR



THE N. S. U., A FOREIGN-BUILT MACHINE

The Commercial Section

DESPITE the great strides that the commercial vehicle branch of the motor car industry has been making during the last year or so, the displays of business vehicles are a rather insignificant feature of the exhibition. Such industrial vehicles as are shown are scattered in the remote ends of the subterranean galleries of the basement, where their huge proportions are entirely out of keeping with the low ceiling and cramped spaces. At the time of writing the spaces reserved by the Packard Motor Car Co. and the Champion Wagon Co. were unoccupied.

By far the most interesting exhibit and one marking a new departure in American production is the ponderous road train built by the Alden Sampson Mfg. Co., of Pittsfield, Mass. This was completed about 24 hours before the opening of the show and was driven to the garden from the freight yards at One Hundred and Thirtieth street under its own motors supplied by a storage battery borrowed for the occasion. It was explained that in the hurry of getting it ready a silent chain did not properly fit and rode the sprockets. The train consists of a tractor and two trailers, each independently driven by electric motors. Each unit runs on six wheels, the middle pair being the drivers and considerably larger than the end pairs. Steering is by four wheels on each car, the front and rear pairs being interconnected and a special tongue provided for attaching to the tractor or car ahead so that in rounding turns the wheels of the whole train will track. The drive wheels are 54 inches in diameter and carry half the gross load, while the steering wheels which divide the remaining half between the two pairs are 42 inches in size. All are shod with iron tires. The tractor and cars can be run in either direction equally well, the two ends of the trailers being identical, so that they can be connected up from either end like a railroad freight car. The tractor, which can be handled by one man, carries an independent power plant. A four-cylinder Buffalo gasoline engine extending under the rear of the hood and footboards drives through a silent chain to a large electric generator directly in front of it at the front end of the hood. The power plant and radiator are carried on a separate frame supported on the main frame by a special form of spring suspension that relieves the plant of excessive shocks and from damage due to twisting. The voltage is arranged to be varied

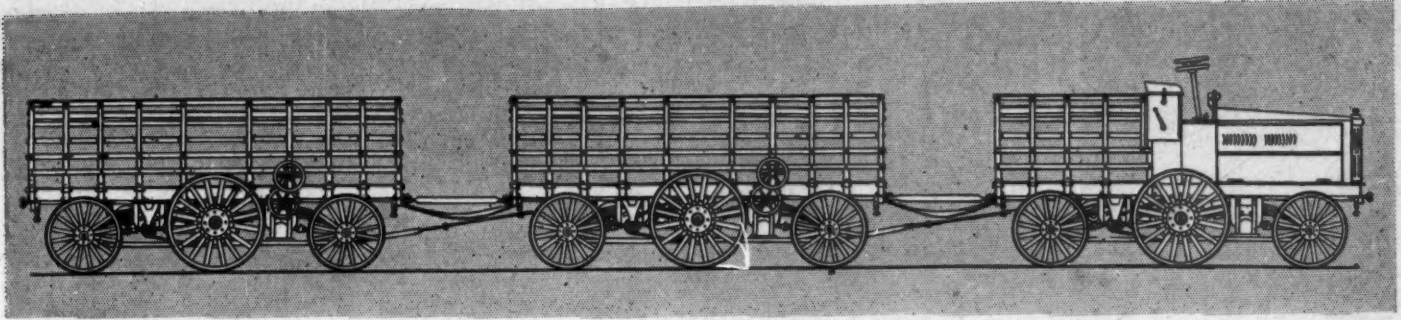
through a wide range, which insures that the full current capacity of all the motors is within the range of the engine. Series parallel control is effected by a rotary switch that is interlocked with the starting rheostat, making it impossible for the operator to damage the apparatus. Switches are provided so the operator can drive the train with the motors of the tractor alone or operate a car or cars independently of the tractor, to facilitate making up the train in the yard. The electric current is conducted from the tractor through four cables to the cars behind, sockets being provided for quick attachment and detachment of the cables. The tractor and each car has two motors, one driving either of the drive wheels through back gears and 1½-inch pitch roller chains. Instead of being placed side by side, the motors are disposed one in front of the other, being suspended from the car frame by springs and especially designed to withstand severe usage and neglect. Draw bars are used between the cars, but as each car is self-propelled their function is to preserve the correct distance and equalize traction. Braking is effected electrically under ordinary conditions, but for emergency use on heavy grades a hand wheel directly under the steering wheel on the tractor is used to set powerful expanding shoe brakes within the sprocket drums on the tractor driving wheels. Similar brake apparatus is applied to each trailer to be operated if necessary by an assistant riding on the cars. Except in very hilly country the entire train can be handled by one man on the tractor. Besides carrying the generating plant, the tractor has a load capacity of 3 to 4 tons, and each trailer can carry 6 to 8 tons, the total carrying capacity of the train of three vehicles being placed at 20 tons. The platforms of the cars are 17 feet long by 4 feet 2 inches wide. Each car weighs 7,000 pounds. The wheel gauge is 72 inches, and the turning radius of the entire train is 20 feet, measured to outside of the wheel hubs. Maximum speed is 6 miles an hour on level macadam roads and 5 miles on soft dirt roads. On a 5 per cent grade the speed is 3 and 2½ miles, respectively, and on a 10 per cent grade 2 and 1½ miles an hour, according to the nature of the road. Each car body is carried on three axles through four semi-elliptic springs of extra length, which are pivoted at their inner ends and guided in pedestals, thus equalizing the load on the six wheels when traveling over rough ground. The ends of the springs simply rest in pockets on the axles, thus contributing great flexibility.



GENERAL ELECTRIC CO.'S HEAVY TRUCK



KNOX FOUR-CYLINDER TRUCK



SAMPSON COMMERCIAL TRAIN, WHICH CREATED A SENSATION AT THE SHOW

The Knox Automobile Co. is exhibiting its new four-cylinder vertical air-cooled engine truck for the first time. This is a 3-ton wagon fitted with a stake body painted bright red. The power plant is practically the same as the 30-horsepower plant used in the Knox touring car, with only such changes in detail as were required to adapt it to trucking purposes.

Another new gasoline commercial wagon is the new two-passenger taximeter cab or station bus shown for the first time by the H. H. Franklin Mfg. Co. This has practically the same body as the model J 1-ton truck, except that the springs are lighter and 4-inch pneumatic tires are used instead of solids. The four-cylinder vertical air-cooled engine has $3\frac{3}{4}$ by 4 inch cylinders and develops $17\frac{1}{2}$ horsepower at 1,500 revolutions per minute. A wheelbase of 75 inches enables the cab to be turned in a narrow street.

Since the reorganization of the old Vehicle Equipment Co. under the present name of the General Vehicle Co. the line of electric trucks and delivery wagons built in Long Island City has been entirely redesigned, with the result that the present machines are much lighter in proportion to carrying capacity and are more economical of current. Instead of two small motors carried on the rear axle, the machines are now driven by one large motor suspended from a cross member of the frame, which drives to a housed countershaft by a Morse silent chain. Roller chains transmit the power to the wheels. Roller bearings are used in the wheels and countershaft and ball bearings in the motor, which is of General Electric make. The old pedestals for the axles have been done away with altogether. A continuous torque controller is now used and the battery boxes are much smaller. It is claimed that one of the 3-ton trucks will now go 25 miles over city streets on a fifteen-plate battery, whereas a nineteen-plate battery was formerly required to do the same work. The company's exhibit includes a 1,000-pound delivery wagon, a $3\frac{1}{2}$ -ton covered wagon built for the City Dressed Beef Co. and a 5-ton stake truck.

Changes and improvements in the Studebaker Automobile Co.'s line of commercial cars are mainly in the minor details, with a view to economy of current consumption and repairs and increased load capacity. There has been an increase in the size of the batteries, forty-four cells being provided for this year in

place of forty formerly. Double motor drive has been retained except on the 800-pound covered delivery wagon, an attractive example of which is on exhibition, together with one 1,000-pound chassis and one 2,500-pound express wagon. All batteries are underslung.

An interesting new feature of the big 5-ton trucks shown by the Hewitt Motor Co. is the spring suspension of the radiator, which the makers were forced to adopt owing to the difficulty they had with leaky radiators. Since suspending the radiator in this way there has been no further trouble, it is said, although the Livingston radiator used on this truck is made of the thinnest of copper sheet metal, dip-soldered on the front and rear sides. The radiator is carried vertically in front of the dash between two heavy brackets slotted at top and bottom to receive vertical rods on either side of the cooler.

Otherwise the Hewitt trucks, delivery wagons and omnibus remain about as formerly, except that now ignition is altogether by high-tension magneto. A new carburetor also has been designed by Mr. Hewitt, which gives a constant mixture, resulting in a constant torque, and is especially suitable for six-cylinder engines.

An attractive little police patrol wagon that anybody might like to ride in constitutes the commercial vehicle exhibit of the Baker Motor Vehicle Co. It has a carrying capacity of ten persons inside, and the body is interchangeable, the same chassis being used for a Pennsylvania cab body. The frame is of pressed steel and carries an underslung battery of forty cells. A 5-horsepower motor is hung from a cross member in front of the rear axle and drives by chain to a forward countershaft and thence by side chains to the wheels.

Silent chain drive to countershaft and roller chain drive to rear wheels contribute quietness in operation to the new Pope-Waverley commercial wagons. Light running is secured by the use of ball bearings on the light vehicles and Timken roller vehicles and double motors the large ones. A newcomer among exhibitors in the commercial vehicle field is the Champion Wagon Co., of Owego, N. Y., which has one model on exhibition. This is a light delivery wagon with closed body.



MONSTER TRUCK OF HEWITT MAKE



ALDEN SAMPSON'S SIX-WHEEL TRUCK

Ignition and Igniting Devices

IGNITION is an ever-ready topic, not only among owners of cars, but among those who are responsible for their design and their production; as a matter of fact it is doubtful if any other topic receives the attention that this does. Although there are thousands who are striving to better the many ignition schemes that are in use today, there is little real progress from year to year. There has been vast progress, however, within the past 3 years. It is perhaps only natural that most of this progress should be in the high-tension system, for there has been so little change in the low tension as to be hardly worth mention. American builders, except in a few instances, do not seem to favor this form, and the apparent falling off in the number of makers using it may be attributed to the fact that in the past in the table of statistics the foreign cars, a majority of which use low-tension ignition, are absent from this show and were also absent from the show of the Automobile Club of America. In the latter show there were 173 cars having jump spark and only 14 with make-and-break; in the licensed show there are 19 with make-and-break and 137 with jump spark. At the importers' show in January the proportion will be materially altered. The principal reason for the lack of the use of the make-and-break system is probably that a jump-spark outfit can be installed cheaper than can one of make-and-break. By this is meant to include the extra work that is necessary in the machine shop. The makers of jump-spark outfits are today offering so many good things that it is not to be wondered at that the makers of cars should feel content to leave the make-and-break system—good as it is and simple as it is—alone in order to be relieved from that much worry in manufacturing or assembling. There has of a sudden come a desire to do away with all the ignition devices save a single magneto. This the Simplex people have adopted, although it is not new, for the Dorris Motor Car Co., of St. Louis, fitted its roadster this way last year and some of the boat manufacturers have been doing so for a number of years.

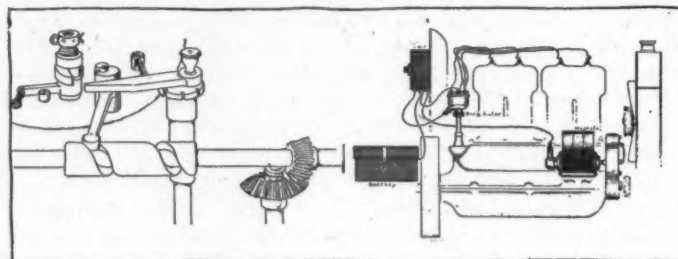
There has been a decided improvement in the design of magnetos, in coils and their parts, and particularly in timers. Batteries, too, have not been lacking in attention from their makers and even wire has been bettered. In the timers an honest endeavor has been made to use materials that will survive both the action of the current and the effects of lubricants upon the insulating materials. There are all sorts of timing devices and distributors. In the former, however, the roller contact seems to lead all others in popularity.

Perhaps the most notable feature of the show as regards ignition is the overwhelming predominance of dual ignition, magneto plus accumulator, among the higher-priced cars. Numerically the Bosch high-tension magneto easily holds first place, though the Eisemann is found on a considerable number of the highest class cars, such as the Pope-Toledo, Peerless, Winton and Packard. The Gianoli is observed on the Columbia gasoline-electric, and is possibly on other cars as well. On the larger Buick cars the Remy high-tension magneto is observed without battery alternative. Among the cars using the Bosch high-tension magneto are the Oldsmobile, Haynes, Lozier, Royal, Stearns, Pierce-Arrow and Thomas Flyer. The Matheson carries the low-tension Bosch, and the Locomobile retains unchanged the same special low-tension system which it has used for the last 3 or 4 years. The Thomas Flyer uses the Atwater-Kent spark gen-

erator as the alternative to the magneto, and the Elmore provides the Atwater-Kent system without any alternative, as the makers state a single set of six dry cells will last for 2,000 miles or more of ordinary running when used with this system.

Among the cars using Eisemann magnetos, the battery system is sometimes entirely distinct from the magneto, as in the Peerless and Packard, while in others, like the Winton, a switch throws the battery into the magneto circuit, and the same plugs as before are sparked through the distributor of the magneto. The Eisemann magneto is equipped to meet the views of those desiring either system.

Last year the Peerless motor carried a stationary timer, in which the advance was obtained by cutting the vertical timer shaft and rotating the upper half of it on the lower half by means of a spirally-grooved sleeve, which was shifted up and down. This year the Lozier shows a timer of the same gen-



STUDEBAKER IGNITING DEVICE AND HOLLEY STANDARD MAGNETO

eral character. The Peerless ignition has not been greatly changed, but one detail is of interest. This is the use of a solid conduit of hard insulating compound in which the secondary cables for both the magneto and the spark coils are embedded. These cables terminate in sockets in the ends and along the top of this conduit, and short lengths of flexible cable with spring plugs attached to their ends connect the sockets with the secondary spark coil terminals, the secondary magneto terminals and the spark plugs for both systems. The conduit is supported on brackets bolted to the cylinder heads, and it has a channel underneath in which the primary wires from the timer to the spark coils are laid. The rear end of the conduit projects through the dash, and it may be easily imagined that the whole arrangement will practically eliminate trouble with the secondary wiring.

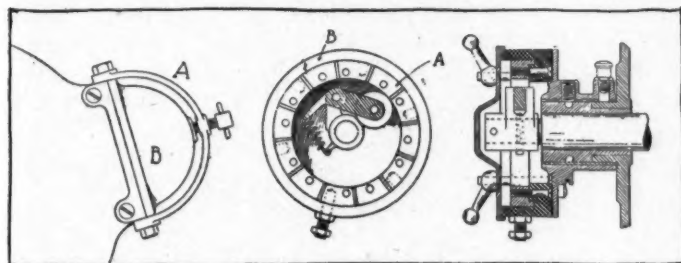
A detail whose usefulness is quite out of proportion to its conspicuousness is seen on the Pierce-Arrow motors. As usual the timer is carried on a vertical shaft, but to prevent the timer body from oscillating, owing to possible vibration or looseness in connections, it is flanged horizontally underneath. This flange matches a flange on the stationary housing which carries the upper end of the shaft. A pair of studs threaded into the stationary flange pass up through curved slots in the movable flange, and carry compression springs and washers, which hold the timer body steady by the friction they impose.

The Holley Brothers Co. shows, in addition to its standard magneto, a special small magneto for the Ford runabout. This little magneto carries a distributor and is provided with a separate spark coil and all the necessary fittings and attachments for immediate installation on the motor. The battery previously

used is retained as an auxiliary, and is wired up to the magneto coil. By throwing a switch, current may be drawn from either the magneto or the battery, the same timer, coil and distributor being used in either case. The latest standard Holley magneto is changed in one particular: The timer and distributor, instead of being built into the magneto, are arranged to be attached to a shaft on the engine like the ordinary timer and distributor for synchronized battery ignition. As these same parts are used when current is drawn from the battery, it follows that by this arrangement the magneto can be dismantled for repairs without crippling the car and without requiring the use of a second timer and distributor outfit.

The endurance test of the Atwater-Kent spark generator, which was begun at the opening of the Grand Central palace show October 25, is continuing at the garden show with the seal unbroken and the plug still sparking. It will be recalled that the apparatus, consisting of the spark generator, six cells of Columbia No. 6 dry battery, four spark plugs and a Jones speedometer-odometer, was officially sealed by the A. C. A. show committee at the opening of the palace show as a demonstration of the high economy of the spark generator. At the end of the show the odometer registered over 1,700 miles, and in order to insure the batteries being exhausted before the end of the garden show the apparatus was transferred to the sales room of Harry S. Hout, the New York agent of the Thomas Flyer, where it ran from Friday till Monday morning.

The Studebaker, which is built on the Garford chassis, has the Garford make-and-break system, with low-tension Bosch magneto and the contact igniters in the equipment. The vertical shaft



THOMAS MAGNETO PINION COVER

FRANKLIN TIMER

turns continuously and carries at its upper end an eccentric pin on which works an arm, held by the spring against an eccentric. This arm, which is of hardened steel, trips the snap cam, which is connected with the coiled spring with the igniter arm. That stem has attached to it an arm, on which a spring acts to hold the igniter out of contact except when the arm engages the snap cam. The ignition is timed by rotating through the shaft, the bevel pinion and gear, and the spirally grooved barrel. The effect is to cause the cam to trip earlier or later, owing to the slight movement imparted to the arm by the eccentric.

The new Thomas taxicab motor takes current for ignition from a small Bosch high-tension magneto, and no alternative current is provided. The magneto is mounted on the crankcase, close behind the two-to-one gears, and carries a steel pinion directly

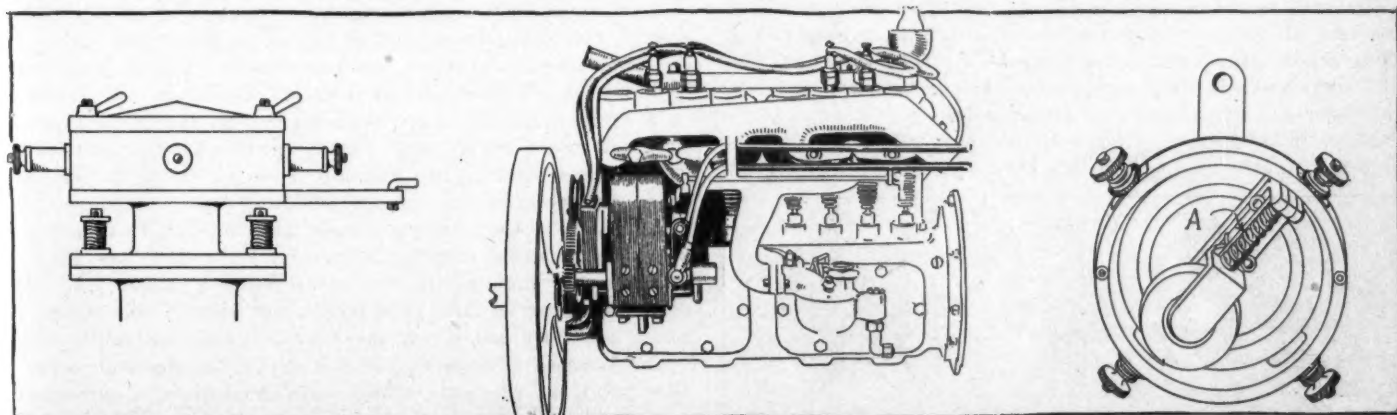
on an extension of the armature shaft. A pair of straps and wing nut clamp the magneto down, and the aluminum housing over the gears is split slantwise on a plane through the center of the armature shaft, and a removable cover provided. As the sketch shows, a swinging yoke A clamps the cover B by a thumbscrew, and when this screw is slackened and the straps over the magneto swung back, the magneto and pinion may be taken out.

Another sketch shows the new Mosler roller timer. The roller is of unusual size and runs on a ball bearing. A compression spring A insures firm contact. By withdrawing two cotter pins the frame carrying the roller may be taken out. A spring in the cover presses against the center point of the roller carrier, and the ground wire is attached to the central binding post outside. The contact segments, which are embedded in the fiber body, are laminated—brass, copper, steel, copper and brass. This is claimed to give a superior combination of wearing qualities and conductivity.

The timer of the Franklin is new, and the Franklin company's own make. It is of the roller type, but has hardened steel contact segments screwed into a fiber body, with similar but longer dead segments between them, so that the roller never touches the fiber. The object, of course, is to equalize the wear. Narrow air gaps separate the live from the dead segments. The general construction is shown in end view and part section in a sketch. A is the fiber body, attached by screws to an aluminum back B. This back threads on a sleeve C, carrying an oiler, and the shaft is shouldered to hold the sleeve in place. Both the live and dead segments are held by recessed screws, shown by the dotted lines, put in from the back, and the studs D connect the live segments with the binding posts. The small studs EE, on which the cover-retaining nuts are screwed, are threaded into the dead segments. A steel tube carries all the primary cables from the timer to the coil, and the cables are differently colored for ready identification. Alternate ignition with separate plugs is given by a Bosch high-tension magneto.

So far as observed, none of the cars equipped with low-tension ignition gives an alternative high-tension system; in other words, all the dual ignition systems are purely high tension. At first blush this might be thought to show that the low-tension system is decidedly preferable, but probably the real reason is to be found simply in the fact that the latter, though it undoubtedly requires more adjusting in the garage than the high-tension system, seldom gives trouble on the road, and it is the special object of a second ignition system to avoid roadside delays.

A progressive tendency to the adoption of special forms of cable ends, with a view to eliminating the once frequent annoyance of strands broken inside the insulation is easily discernible. Nearly all of the more expensive cars are provided with one or another form of cable end, generally shaped for quick connection to the timer, magneto or plugs, and sheathed with hard rubber to protect the wire strands from rough handling. In the same direction is the general provision of tubes, special insulating brackets, etc., to locate and protect the cables.



PIERCE TIMER TENSION

HOLLEY MAGNETO ON FORD RUNABOUT

MOSSLER ROLLER TIMER

Chassis Components

AN ENORMOUS variety of those things which are essential to the motor cars—those parts which are not luxuries or extras, but which cannot be dispensed with—is on view in the garden. The booths where these appear are found everywhere except on the main floor; they are numerically strong in the basement, they fill the concert hall almost to overflowing, and the balconies and galleries are almost given over to them. Nevertheless, one looks in vain, for the most part, for things he has not seen at previous shows, or for new designs in old things. Perhaps the spirit of the industry was expressed by the manufacturer who, when asked if he had anything novel for 1908, exclaimed fervently; "No; thank goodness the time has passed when a concern had to have a whole lot of new freaks every year or else be considered a back number!" Still, there are enough new things—none of them in the freak class—to add a strong spice of interest to the show as a whole and to indicate that inventive faculties are not by any means dormant.

A new and very interesting combination of air pump, water circulating pump and lubricating oil pump is shown by the Wray Pump and Register Co. of Rochester, N. Y., and is the invention of Mr. Kellogg of that firm. Equally spaced around a central shaft, and parallel with it, are four small air cylinders whose pistons and connecting rods are given a reciprocating motion by a grooved cam on the shaft; the cam ends of the rods have crossheads which slide between guides. A comparatively large cylindrical brass casing surrounds all four cylinders and is filled with water for carrying off the heat generated by the compression of air. The driving shaft passes clear through this jacket and its opposite end drives a water circulating pump of the gear type—that is, one in which two gears in mesh draw water through an enclosing housing. The main shaft drives one of the gears direct, the pump casing being attached to the waterjacket of the air pump. From the second gear of the waterpump projects a shaft which drives directly a rotary oil pump. The water and oil pumps are permanently connected and so run at all times when the main driving shaft is running, but the air pump may be connected and disconnected at will by means of a positive clutch of the jaw type engaging the grooved cam. At the same stand is a combined timer and distributor, in which the primary contact is made by a small plunger raised four times each revolution—the timer is for a four-cylinder motor—by a plate cam, while the secondary current is distributed to the plugs by a disk of insulating material behind the cam plate; the whole is enclosed in a hard rubber casing. The various self-contained units can be arranged to make timer and distributor in one instrument, a plain primary timer, or the timer and distributor may be separate.

Much interest is manifested in the new Michelin demountable rim, shown by the Michelin Tire Co., of Milltown, N. J.,

manufacturer of the American Michelin tires. The rim, carrying the fully inflated tire, is clamped between hooked lugs, eight on each side, one set being permanently attached to the wheel and the other set removable by the unscrewing of the eight nuts from the eight bolts that pass through the wood felloe. The removable hooked clips have wedge-shaped extensions that go between the removable rim and the steel rim of the felloe, so that the two rings are kept out of contact and cannot rust or stick together. A Michelin tire, made especially for use with demountable rims, has a stiff wire bead and, the makers state, can be fitted without difficulty to any of the well-known makes of demountable rims. This tire is of the round tread type.

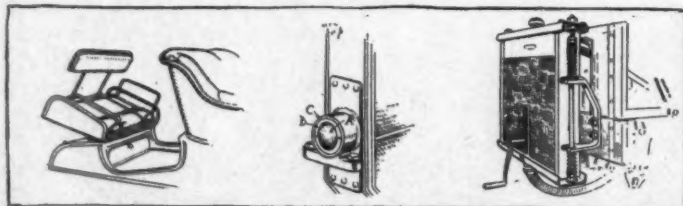
In the Continental quick detachable rim, shown by the Continental Caoutchouc Co., the removable clips are not hooked over the removable rim, but have beveled faces corresponding with the surface against which they bear, and wedge-shaped extensions extending under the rim and separating it from the steel felloe ring. Tightening up the nuts produces a wedging action that holds the rim securely, while the back pressure on the nuts keeps them tight.

A new type of cushioned solid rubber tire is exhibited by the Motz Clincher Tire and Rubber Co., of Akron, O. This consists of a solid rubber tire, with the tread of any desired form, with deeply concaved sides. These channels are not continuous, however, but in them are webs of rubber alternating with spaces all round. The webs are, of course, integral with the tire proper and are placed tangent to the rim, not radially. The fastening of the tire is the regular Motz cross-wire system. Various thicknesses of the webbing adapt tires to various weights of cars, and the new tire is stated to be remarkably resilient and durable.

Knowing a solid disk wheel is much stronger and heavier than is necessary for a pleasure vehicle, the Indestructible Steel Wheel Co., of Chicago, has brought out and is exhibiting a pressed steel disk wheel of new type for this class of service. Spokes are formed in relief on the disk faces, and between the spokes circular openings are punched, greatly lightening the wheel both in fact and in appearance, but still leaving a great reserve of strength. When painted and equipped with a tire this wheel has a much better appearance, for pleasure car use, than the solid disk type.

Down in the basement, where there is solid support for great weight, the New Departure Mfg. Co., of Bristol, Conn., is showing two enormously heavy cast iron wheels mounted on a new ball bearing. There are two rows of balls, each row running in a separate groove in the solid inner race, the grooves being deep and giving a very large bearing surface for the balls. The outer race is made in two halves or rings and these are held in place by an outer ring having shallow flanges to fit over the edges of the rings. An ingeniously designed ball retainer finds space between the rings. The makers state that this bearing will not only stand a load two or three times greater than any other ball bearing they have tested, but that it will stand up under a heavier end thrust than any other radial ball bearing.

The Western Electric Co., of New York, has a complete ignition outfit on exhibiton, demonstrating its new synchronized system. In this the coils are placed beside the cylinders and



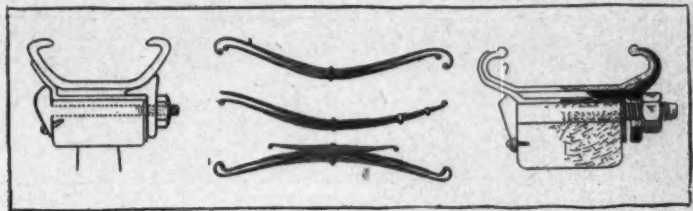
SPRINGFIELD FOLDING SEAT, A. Z. RADIATOR SUPPORT, RAPID RADIATOR

the vibrator on the dash, a single master vibrator being used and connected to the coils by a single wire—the only wire passing through the dash. A small coil is of course used to operate the vibrator. From each coil a single wire leads to the spark plug it serves; the timer is mounted in front of the dash. The main coils are enclosed in hard rubber cylinders and may, of course, be mounted above the cylinders of the motor or in any other convenient position.

The amazing popularity of the runabout has brought into existence many body designs. One of the latest is shown by the Springfield Metal Body Co., of Springfield, Mass. There is a folding rear seat the full width of the body, with skeleton back and arms, and a divided front seat. The rear seat folds down when not in use, leaving a flat, sloping deck; the arms and back are first folded down and held by straps, and the entire seat is then tilted over and a brass catch turned to hold it securely in place.

Another neat idea in the body line is the light runabout fish-tail with folding rear seat seen at the booth of the A-Z Co., of New York, manufacturer of motor car parts. This is a rear deck of aluminum with a neat folding seat, and weighs, complete, only 55 pounds. It can be made in steel if desired, when the weight will of course be somewhat greater. Any kind of leather can be used in the upholstery. The same concern shows a radiator ball-joint device that is designed to eliminate all the twisting and racking stresses that are imparted to the radiator rigidly attached to the car frame. To each side of the radiator frame is riveted a bronze plate carrying an integrally-formed ball on a short shank. Two bronze castings, each forming half of a sphere internally are placed over the ball on the short shank, fitting it perfectly, and over the outside of it is slipped a bronze retaining ring carried on a base which is bolted to the frame of the chassis. Thus the radiator is free to move in any direction and is relieved of all external stresses. There are of course two ball joints, one on each side. The A-Z pressure tank for gasoline is another good idea. The tank proper, of the form generally used when hung below the chassis at the rear, is of heavy copper. As protection against dents from flying stones or other causes, and from possible puncture, the lower part of the tank is encased in a sheet of steel and between the steel sheet and the tank is a heavy layer of felt. The combination is said to work admirably in actual use.

A new type of high-efficiency radiator, shown by the Livingstone Radiator Co., of New York, is made up of sheets of thin copper pressed to form a succession of alternating channels, each channel forming three sides of a square. The construction is difficult to describe, but an examination of the device shows that the edges of the sheets, forming the front and back of the finished radiator, are lapped and soldered by dipping, making a very strong construction—in fact, the regular factory test calls for successfully withstanding 15 or 20 pounds pressure with hot and cold water, sections having been tested to 40 pounds without leaking. The makers state that freezing the water in the Livingstone radiator has no bad effect because the corrugation of the metal permits considerable expansion and the temper—what is known as half-hard—permits the copper to spring back into place when the ice has melted. In appearance the radiator is extremely attractive.



CONTINENTAL RIM

PERFECTION SPRINGS

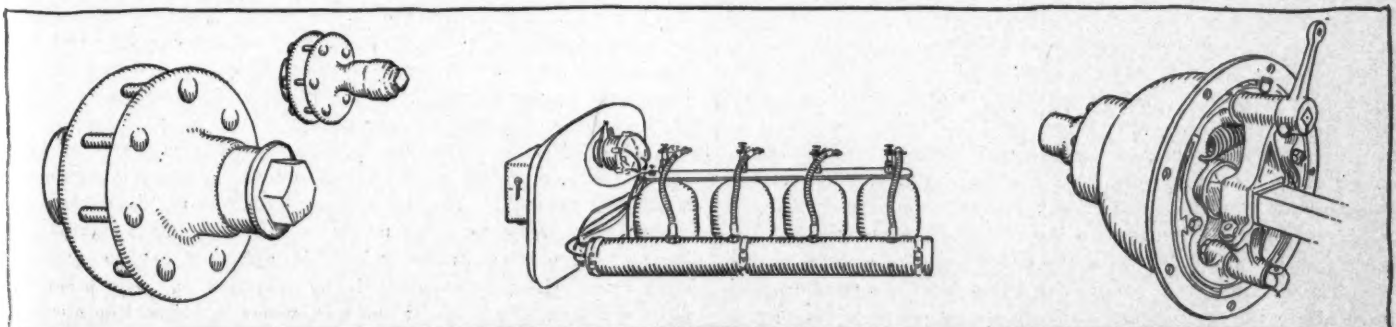
MICHELIN RIM

In addition to a large variety of axles, both front and rear, and steering gears and hubs mounted on its bearings, the Standard Roller Bearing Co., of Philadelphia, shows a three-speed Standard transmission axle, in which the three-speed gearing is mounted on the rear axle in its entirety. The drive is by propeller-shaft and bevel gears and the shafts throughout run on Standard ball bearings of the annular variety. The differential and the transmission gears are all enclosed in a single crucible cast steel housing which holds all the parts in permanent alignment. Two aluminum covers, one over the differential and the other over the change-speed gears, give quick and easy access to these parts. Rear axle, propeller shaft and tubular torsion members are of chrome nickel steel; the outer casing of the rear axle carries the weight of the car in the way well known to motorists, the wheels being driven through squared shaft-ends and clutches on the wheel hubs. All gears are of chrome nickel steel of 1-inch face and 6 pitch, with stub teeth. A fine specimen of heavy truck work is shown in a hub and axle for a 5-ton truck. The axle is of square steel, of massive proportions, and the huge, bell-shaped hub has within it the brake mechanism, which is completely enclosed from dust by a plate bolted to the inner, open end of the hub. The whole design gives the impression of extreme strength and solidity.

An effective study in contrasts is presented at the stand of the Timken Roller Bearing Axle Co., of Canton, O., in a huge 5-ton truck hub and axle, the latter of square steel 3 inches across with a spindle $3\frac{1}{2}$ inches in diameter, and a hub for a small runabout; the two are mounted close together so that the difference in proportion is most striking. Both are mounted on Timkin roller bearings. The whole gamut of sizes between these two is run by the exhibit.

Refinement in springs is to be expected in this age when the utmost comfort is demanded, and it is found in the exhibit of the Perfection Spring Co., of Cleveland, O., which shows the McIntyre two-part spring for vehicles. This spring is made with a light section and a heavy section, proportioned to suit the service and the weight of the car. The heavy section comes into play only when the road is abnormally rough. The manufacturers state that these springs which he is marketing take the place of ordinary springs equipped with shock absorbers as found on motor cars.

A new non-skid attachment for solid tires has been brought out by the Weed Chain Tire Grip Co. and is on exhibition. It has flat steel plates that take the place of the usual cross chains of the Weed tire grip. These plates are placed at intervals of about half a foot around the tire, and are linked to heavy side chains. The device is attached by means of a special tool that draws the chains tight.



TIMKEN ROLLER BEARING

WESTERN ELECTRIC SYNCHRONIZED SYSTEM

MACK HUB, WITH INTERNAL BRAKE

Electric Vehicles

T-M WILDER



THE electric vehicle display is of the same comprehensive character that is seen yearly at the A. L. A. M. and with two exceptions, one in the main gallery and one in the basement, is in its familiar place, the large room to the right of the lobby. Nothing startling presents itself, a condition eminently in keeping with the type of car under discussion, yet three cars are shown, the Baker, the Rauch & Lang and the General Electric, that in body design are counterparts of the present day racy-looking gasoline runabouts. The familiar box body runabout continues to be shown, however.

The attraction of the Baker display is the roadster made on the full rakish lines of long bonnet, rakish steering wheel, seat well back and with a third passenger accommodations in a rear rumble. Under the hood is carried the full battery equipment and above the steering wheel is the control lever. The motor is carried under the footboards and drives through a planetary gear reduction and propeller shaft. The chassis for next year has a pressed steel frame in place of armored wood and is hung on semi-elliptic springs. The other models shown are a coupe, a Queen Victoria, a landaulet and a chassis. On the landaulet the control lever is below the steering wheel, in the victoria, the coupe and the chassis it is at the side, with side tiller steering.

The Columbia line of the Electric Vehicle Co., on exhibit embraces a brougham, a landaulet, a small phaeton, a hansom and a victoria phaeton. All are mounted on pressed steel chassis with the batteries underlying except in the small phaeton, in which they are divided one-half rear and one-half front. On the big cars, such as the brougham and landaulet, the steering is by wheel, with the controller under it. The motor is connected to the rear axle by a double reduction helical gearing. On the lighter models, such as the victoria, the drive is by direct shaft and drive through a reducing gearing to a live rear axle in its tubular casing. The steering is by side tiller.

The Babcock carriages are shown in roadster, victoria phaeton, stanhope, coupe and brougham types. In all models the control is at the left of the seat cushion and the steering is by wheel, which has a universal joint for tilting so that entrance may be had from either side. In the roadster, victoria phaeton and coupe the same chassis is used. This has its thirty-six-cell battery divided between front and rear and carried on the floor line. The motor is suspended under the seat and drives through side chains from a crossshaft that is chain-driven from the motor. On the stanhope the motor is at the right and forward of the rear axle, with the drive through a spiral pinion. The brougham has two motors placed right and left, in front of the rear axle and with spiral pinion drive.

The electric pleasure vehicle display of the Studebaker cars shows four models, a victoria phaeton, a stanhope, a runabout and a fourteen-passenger omnibus, this line being the result of its pioneer experience as a motor car builder. The first three named are all of the same construction features. The motor, a single motor, is suspended from the body frame under the seat and drives by a single chain to the center of the rear axle. The steering is by side tiller, with the control on the same side, the left. The omnibus has two motors hung from the running gear frame above the springs and each drives by chain to its respective rear wheel. The battery of forty cells in four separate units of ten cells each is carried beneath the body in a trussed

compartment suspended from the frame of the running gear. The steering is by wheel, with the control at the left of the driver. The seating capacity is exclusive of the driver. The baggage rack is on the roof.

The General Electric has a new model in a roadster that carries out the lines of the gasoline runabout, with its third passenger seat at the rear and further accentuating the appearance by two side levers, one for the hub brakes and the other for the controller. The front bonnet of course covers the battery. In the phaeton and box body runabout models the motor is under the seat and the drive is by a reducing chain to two side chains. The batteries are divided between front and back and the cars have side steering and control. In the landaulet shown the battery is under a front hood. The steering is by wheel, with the control at the center.

The Rauch & Lang exhibit embraces a landaulet, a coupe, a stanhope and a chassis. In all models the battery is carried part in front and part in back, with the motor placed under the body, driving through a reducing chain to a crossshaft and final by side chains. The control is at the side in all those shown and the steering is by side tiller except on the landaulet, which has a wheel.

The Pope-Waverley has a striking display of its latest model of the victoria coupe with its many changes of top due to its construction design. With the one car the owner can have a top phaeton, an open victoria and a closed coupe. There is also the victoria phaeton type that can be as readily changed to suit the desires for the particular drive to be enjoyed, to an open victoria, a woman's runabout or a park phaeton with sunshade canopy, or it can have a buggy top with removable side curtains, the rail for this top being removable for runabout or open phaeton uses. In these the side sill is lowered at the center so the step is brought near the ground and a low seat is secured. The battery is divided between the front and back and the motor is carried forward of the rear axle in regular Waverley practice. Steering is by side tiller.

The construction feature of the Woods vehicles is that the entire power mechanism is carried on a manganese bronze unit frame. This frame is rectangular in shape with its length crosswise of the vehicle body. The motor is at one end and rather above the frame line. At the inner end of the motor is a herring bone pinion that meshes with an underhung gear, which has a universally jointed countershaft carrying end spokes for the final drive by side chains. The battery is divided, front and rear and the tiller steering and control levers are at the left side. The bodies shown are of the Queen Victoria type, so constructed that a detachable brougham top can be equipped for winter use. The change is made from the victoria to the brougham top by means of a rail, on which the former is built, that is held in position by four units.

The Columbus is a one-type chassis, one of them being part of the exhibit, on which is mounted a coupe, a victoria phaeton or a canopy phaeton. The battery is divided and placed under front and rear hoods. The motor is under the seat, carried on its own supporting frame, which is attached to the pressed steel frame sides. The drive is by side chains. The steering is by a tilting side tiller at the left, where is placed the control lever. This latter has an interlock that shuts off the current before passing into the reverse speeds.

Lubrication and Lubricants

WHILE the matter of the lubrication of the motor and the other parts of a motor car are of prime importance, the subject is rather a hard one in which to interest the owner, especially at a show or exhibition, for obvious reasons. However, it may be said that the manufacturers of the various lubricating substances displayed show great ingenuity and originality in making their exhibits attractive.

One of the first makers of oil to devote itself solely to the manufacture of lubricants for motor cars and motor boats was the Columbia Lubricant Co., which exhibits a very extensive line of oils ranging in color from the well-known amber to an almost water-white clearness. This company refines its oils to the fire test required and does not depend on blending them.

Orlando W. Young shows, in addition to his well-known lubricants, a line of acid-cure solutions for the repair of tires as well as for sticking patches and plugs.

Pan-O-Lite is the name given to a superior quality of gas engine cylinder oil manufactured by William P. Miller & Sons, of Long Island City. This has a zero cold test and at the same time is as suitable for summer as for winter use.

A feature of the exhibit of the Joseph Dixon Crucible Co. is a transmission gearset filled with Dixon gear compound, operated by an electric motor so that the action of the lubricating substance can be seen through the glass cover of the gear box.

William C. Robinson & Sons Co., an old and well known concern that has been in business since 1832, has only recently entered the field of motor car lubrication. It makes several grades of motor oils for different conditions. A special feature of the exhibit is a device for showing the fluidity of its oils.

Viscos oil, which is made in five grades, as well as Viscos grease, is shown by the National Oil and Supply Co., of Newark, N. J. The special merit claimed for this oil is that it has a higher fire test and lower cold test than ten other motor oils.

One of the most interesting exhibits from many points of view is that of the New York and New Jersey Lubricants Co., maker of the Original non-fluid oils. This company shows a large Matheson transmission with a glass cover, so that the operation of the gears can be seen.

A feature of the exhibit of the A. W. Harris Oil Co., of Providence, R. I., is a revolving tube rack which shows the comparative fluidity of the different grades of oil.

The Shooting Oiler is the name given by the Precision Appliance Co. to the Hill Precision oiler. It may be briefly said that in truth this oiler does remind one of the action of a Gatling gun with its revolving pump barrels and its loading with oil by the action of the pump piston, operated by the inclined circular cam and the firing of the charge from the barrel by means of the pump cylinder slipping off the end of the cam, which in this case may be compared with the firing pin of the Gatling gun. To come down to earth, however, this oiler is of the individual force feed type; unlike most of these, however, only one pump is employed, but this pump is so arranged it delivers to the various feeds in turn, and the length of its suction stroke is varied to suit the point to which it is about to feed.

The Hancock oiler, also exhibited at this show, is another of the individual force feed type, but has a separate measuring pump for each cylinder which delivers to the sight feed which leads to the force pump.

The B-Line oil and grease guns are somewhat of a novelty in their line, being fitted with a metallic piston ground to fit, no packing of any sort being employed. They are fitted with a short closing tip as well as straight and bent oil tips, and a large diameter grease tip. They are made in various sizes and styles. The workmanship and material are remarkably good, especially the fit of the ground piston.

Manufacturing Materials

THE influence of the motor car in the development of new materials, machines and processes is visible everywhere throughout the show. Many of the car exhibits display castings, forgings and completed parts that bear testimony to the present advanced position of the infant motor engineering as compared with older branches of engineering, and the gallery exhibits include many magnificent displays of the most modern materials—steels, bronzes, aluminum alloys—wrought into every variety of form, some distorted to the point of destruction to show the quality of the metal. Instructive and interesting as is this display of complicated castings, drop forgings, remarkable in some cases for their massive strength and in others for their extreme delicacy, and pressed and drawn work of most intricate design, one looks in vain for novelty. It is not that the standards of the makers are lower rather than higher, or that the demands for improvement are any the less insistent, but the enormous progress of the past 7 years has brought the production of motor car material to a point where further advance must be by steps rather than jumps.

A careful tour of the many ovals from the basement to the roof—as the garden is filled this year as never before and even threatens in time to overflow into the subways below the air above—disclosed no important novelty in either materials or processes. All the standard lines are represented, the individual exhibits showing more or less improvement in detail, but along lines already fully described.

One minor novelty is the use of aluminum for coating sheet steel, for bodies and other parts, shown by the American Aluminum Co., of Pittsburg. Protected by a thin coating of aluminum, the steel is rust-proof and at the same time the surface is much smoother than that of the plain steel and yet lacks the extreme high polish of aluminum. The finishing is much simpler than on either plain steel or aluminum, the coated surface taking the paint readily and requiring fewer coats. The material is used for bodies, hoods, fenders, dashes, battery boxes and similar articles.

As an evidence of the quality which it is now putting into its aluminum products, the Light Mfg. and Foundry Co., of Pottstown, Pa., is showing, with a large display of castings of crankcases and other parts, a carriage spring entirely of aluminum, demonstrating the flexibility of this ordinarily brittle metal under proper treatment. This last named device is attracting considerable attention among the trade.

In the line of processes, the Norton Grinding Co. of Worcester, Mass., has in actual operation one of its electrically-driven grinders for crankshafts, using the aluminum wheels also made by the company.

The United States McAdamite Metal Co., of Brooklyn, N. Y., shows a variety of castings made from its metal, which, the makers state, is the strongest light metal known. It has the appearance of aluminum and the castings made from it are beautifully smooth and clean. Weight for weight, it is said to be much stronger than brass or bronze, which it is designed to replace.

Milling machines of the ordinary horizontal spindle type and also an improved vertical spindle machine are shown by the Garvin Machine Co., of New York. The latter is used by a number of motor car manufacturers, and a crankcase, for instance, can be faced off on the top, ends and sides at a single setting, insuring the relative accuracy of these surfaces.

Chrome leather in sheets and special rivets for the manufacture of anti-skid treads are exhibited by C. Dien, of New York, importer and sole agent for the United States for Edouard Dubied & Co., of Switzerland, manufacturers of the Edco spark plug, which is also shown by this same exhibitor.



Running Gear Attachments



T.M. WILSON.

THE purchaser who thinks the check that pays for the car is the finish of spending opportunities probably will be surprised at the opportunities still remaining to get rid of money. It is true the majority of cars have a full equipment of lamps, horns, speedometers, tools, etc., but besides these there are numerous little devices all tending towards motor comfort—and again there is quite a chance, especially with a new driver, of needing new lamps and speedometers to replace broken ones.

One of the real novelties displayed is the Jones automatic speed control governor, which also was shown in the palace. This is an attachment to apply to the Jones speedometer in connection with a controller dial which can be located in the tonneau. The controller, which is calibrated from 10 to 30 miles, and on which the index pointer can be moved to any desired speed, operates an electric switch in the speedometer which automatically governs an electric cut out and which can be connected to either ignition system or throttle, decreasing the speed of the motor.

Another new device in the speedometer line is the Lipman electric speed indicator, which, as its name indicates, is worked by electricity instead of a centrifugal governor. The mechanism of this is a generator attached to the steering knuckle and placed in contact with the wheel through gears in the usual manner. This alternating generator is connected by an insulated copper cable to the speed-recording dial on the dash, the amount of current being proportionate to the speed. This recorder is a volt meter but is calibrated to read miles instead of volts. These calibrations are marked by hand after the instrument is tested.

A general information bureau is seen at the booth of S. Smith & Sons. This is in combination of clock, barometer, perfect speedometer, season and trip odometer and a compass. This is not as bulky an outfit as might be supposed and is equipped with a speedometer of English design, a feature of which is that the connection with the wheel is made by friction instead of through gears. This concern puts these up in combination with clocks or tonneau signal devices or a combination of all. Perfect signal recorders are equipped with a maximum or telltale hand.

The Speedright displayed by the Pierson Motor Supply Co. is a speedometer of the centrifugal governor type. It is equipped with an air cushion or shock absorber between the index hand and governor. This air cushion-absorber is said to absorb all vibration and keep the hand as steady as that on a clock.

Gasoline indicators are of various types but a new one is the dash board gasoline gauge of the Lipman Mfg. Co. This is an ordinary glass gauge in brass frame calibrated in inches. The frame is equipped with studs for attachment. The upper stud is

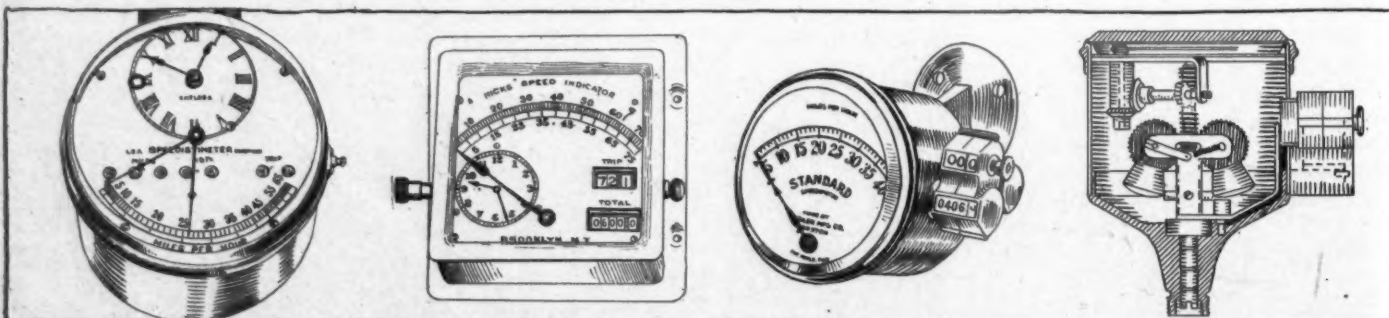
hollow for connection through the medium of a copper tube to the gasoline tank. The lower and middle part of the gauge is a reservoir for a red liquid. The gasoline in the tank enters the copper tube and compresses the air. This forces the red liquid to any desired height.

At this season of the year the purchaser is apt to think of lap robes. There are two exhibitors of these two very essential articles. Hopewell Brothers are showing robes of all colors and weights, made of mohair wave pile, duchess plush covert and many other materials, backed with leather, imitation leather and rubber, according to price, etc. They also show a chauffeur's leather robe equipped with a strap to fasten it around the driver's body.

The Hopewell tire case is a case in which the tire is enveloped and fastened by a flexible wire cable. Hood slips, lamp covers and paper-lined vests are displayed also. The L. J. Mutley Co. has a very large display of lap robes of various colors and combinations of colors to match the particular car and trimmings. These robes are of two thicknesses of material, vulcanized together by a sheet of pure rubber to make them windproof and water-tight.

The individual who does not like the odor or the trouble of filling lamps with kerosene can find a full assortment of electric lamps on display at the Vesta accumulator booth. Dash lamps, searchlights, hand lanterns with long flexible connections, rear lamps, gauge lamps and dome lights of the Holophane globe or flush type are ingeniously displayed. The Vesta electric Simplex and electric cornet horns are shown also at this booth.

The cheapness of denatured alcohol has encouraged its use as an anti-freezing solution. Alcohol, having a tendency to evaporate at a much lower temperature than water, needs constant replenishment. To overcome this waste the radio-escape has been manufactured by the Globe Machine and Stamping Co. This consists of a poppet valve attachment threaded to a screw into a prepared hole in the radiator filling cup. This poppet valve blows off at an 8-pound pressure, when the overflow pipe is stopped up. This concern also makes metal battery and tool boxes lined with wood, the merit of which is apparent to anyone who has had a wooden tool box split. The English & Mersick Co. has a display of coach and motor car lamps of the old English coach type. Also it has an assortment of car trimmings, such as handles, foot rests and coat rails. The Rushmore Dynamo Works are showing their searchlights and generators. The generators show very little change from last season's except there is a needle valve to shut off the flow of water.



LEA SPEEDOMETER

HICKS INDICATOR

STANDARD SPEEDOMETER

EXTERIOR AND INTERIOR

Supply Miscellany

WHILE the comfort and luxury of motoring are better cared for at the present time than ever before, but little that is new is to be seen in the numerous exhibits of the supply houses and clothing makers. The Lean Mann Co., of New York, has added a new cravenetted fabric known as the Roseberry motor cloth, specially woven for motor car wear and declared to be both rainproof and spotproof, porous and self-ventilating. It is made in kahki and many other styles. Another novelty in this exhibit is a winter vest for motorists, yachtsmen and sportsmen, lined with a paper fiber designed to make it rainproof and coldproof. It is cut high, with a collar, and covers the body thoroughly.

The L. J. Mutty Co. is showing with its regular line of motor car rugs and blankets a new fabric, rubber-coated on the back, two pieces being then cemented together, back to back. One face may be of plush and the other of mackintosh or a different material; the rug is claimed to be thoroughly waterproof and very warm. For summer use a very light but waterproof rug is made, and this may match the linings of car and top.

The motor trade long since has attracted the attention of the large tool houses as a new and inviting field and these concerns are now represented, as well as the regular motor car supply houses, at every show. While very fine assortments of modern tools are exhibited, there is little that is new.

In the line of fittings the Globe Machine and Stamping Co., of Cleveland, is showing a Radio escape, a new radiator cap with a spring-controlled relief valve. In addition to acting as a safety valve for the radiator, the device also acts to prevent evaporation, an important consideration where alcohol or other non-freezing liquids are used.

The Star metallic tire case is such a new article with the Merchant & Evans Co. that it is unable to have one on display, but shows instead a full-size wood model. The case will be placed in the market soon, however. It consists of two sheets of metal pressed to the form of a watch case, having a hinge at the bottom where it rests on the running board and a steel strap with a padlock at the top. A bracket holds the case to the side of the car and small chains inside hold the outer half in a horizontal position when let down. In the center of the case, inside the spare tires, two of which can be placed in the case, is a circular compartment for carrying spare inner tubes, etc.

A neat and attractive polished wood case shown at the stand of the Acetylene Specialty Co., of Jersey City, N. J., contains two small steel acetylene gas storage tanks, each of 20 cubic feet capacity, for gas lamp service. In a separate compartment of the case is the pressure gauge and the reducing valve. When one tank is exhausted the other is connected and used, the valve being opened wide and the reducing valve or pressure controller taking care of the pressure so the lamp burner gets just what it requires. The case is secured to the running board like a tool-box and protects the tank from dirt.

Miscellaneous Accessories

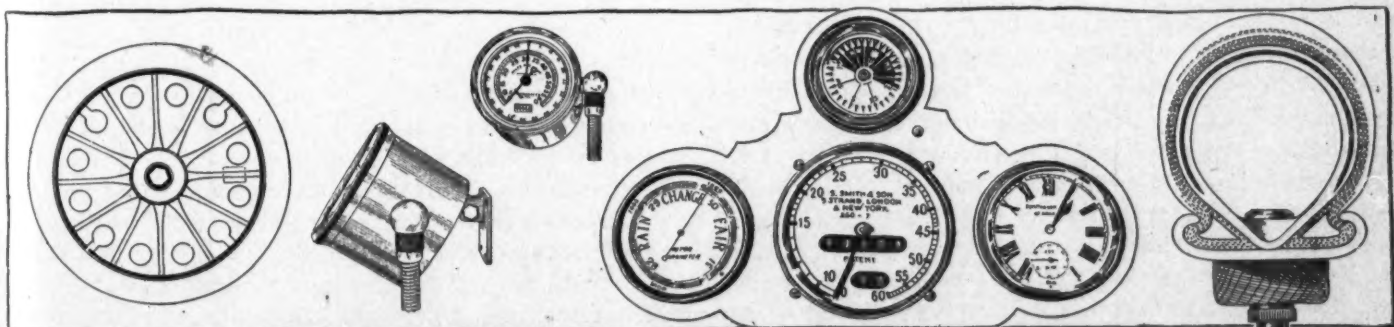
A NEW internal tire protector is exhibited by the Empire State Tire Co., of Buffalo. This is in the form of a crescent-shaped strip of canvas and rubber intended to be placed inside the shoe between the shoe and inner tube. Within the strip are embedded disks of thin steel, coppered, and with their edges overlapping, thus forming a coat of mail within the protector. The disks are placed between sheets of pure gum, which adhere tenaciously to the coppered surfaces of the disks. Another novelty shown by this new exhibitor is the Greenwald non-skid tread that is virtually a reversed Bailey tread, with round holes instead of studs.

The demonstration of the Dow Tire Co. attracts much attention in the basement. Road conditions are simulated by a heavy stand on which a heavy iron drum is driven by an electric motor and an axle and wheel are mounted over it with the tire in contact with the drum, under about the same pressure as there would be if the tire were running on a loaded touring car. Nails are driven through the tire and the apparatus set going for several minutes. When the nails are withdrawn no air escapes. This is due to the composition of paste and soft feathers that is the special self-healing feature of the Dow inner tube.

The Woodworth pneumatic steel tire is a new product of the Leather Tire Goods Co., which is exhibited in the garden for the first time. This is a shoe made simply of chrome leather and having the entire face covered by steel links that provide a non-skid surface and give strength to the leather. No canvas and rubber shoe is used with this, the inner tube of rubber being protected against the inner ends of the rivets by means of the Woodworth leather inner tube. This is also a new product. It is simply a soft chrome leather tube that encases the rubber air chamber and slips inside the steel tire shoe. The steel shoe weighs about 30 pounds.

One of the latest ideas in folding wind-screens is shown by the Troy Carriage Sun Shade Co., of Troy, O. This is a double screen—or may be a triple one if desired—having one-half of glass and the other half of fine wire gauze, so that in warm weather the occupants of the front seat will get the air but will be protected from insects and other eye-annoying objects. By swinging the screen on horizontal trunnions the gauze screen goes down and a glass panel takes its place; or both may be lowered. The addition of an extra glass panel makes it possible to have a whole glass screen. Joints are fitted with spiral tension springs so that they will not rattle.

Reduction of noise in gearing is the object sought by the Joseph Dixon Crucible Co., of Jersey City, N. J., in placing on the market its graphite lubricant No. 688. This is a mixture of graphite grease and very finely-ground cedar sawdust, which not only lubricates the gears perfectly but deadens sound to a surprising extent. A set of gears shown running demonstrates this. The makers state that the compound does not cake in use.



INDESTRUCTIBLE WHEEL

HOFFECKER'S SPEEDOMETER

SMITH'S COMBINATION RECORDER

DOW TIRE

The Western News Company of Chicago
and its Branches Supply Newsdealers

NH. Van Sicklen, Manager



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GARDEN SHOW ONE OF BEAUTY



REAT is the motor car exhibition now in progress in Madison Square garden, New York—the greatest the garden has ever held. It is the greatest because American makers are showing such marked improvement in design, in finish and, above all, in price, the quality of the goods being considered. It is great because this is the simplest yet most beautiful exhibition ever held in New York and it is great because, notwithstanding the fact that there is some doubt as to the financial situation, the crowds are immense. It is true people will go to Madison Square garden regardless of what is the attraction, but the most casual observer can not help noticing that the people at this show are not mere show-going people, but are deeply interested in the motor car. If there has been any doubt as to the outcome of the motor car business for the year 1908 this doubt must have been dispelled early in the week, for there has been every indication that the season to come is to be one of prosperity to the makers of motor cars. Some sensations appeared at the show—good cars at very moderate prices, natty town cars, commercial trains, and numbers of six-cylinder cars. There have been many changes by many makers, and on the other hand there are many others who have thought best to let well enough alone and continue to make what has proved acceptable not only as a selling proposition but as a mechanical proposition as well. There have been some additions to the ranks of the makers of air-cooled motors; on the other hand none of the makers of air-cooled motors has left this form entirely, merely adding the water-cooled. Ten licensed makers are now building six-cylinder cars, two are devoting much time to town cars, some have added double fly-wheels, all are making tourabouts, the selective type of speed change gear has almost superseded the progressive, larger wheels are the rule and there are many other noticeable improvements that are distinctly American and by no means foreign. The day when the American needs to visit Europe to procure ideas has passed; in fact, matters are quite reversed. Commercial cars are booming, the makers are touching not only popular fancy but are making most practical goods. There is increased interest in the motor cycle, as is indicated by the fact that at this show there is the largest exhibition of two-wheelers ever seen in this country. Electric cars appear in superb form, but without material change in design, and accessories are so numerous and so good and so useful as to totally bewilder the motorist and almost make him shrink from passing along the aisles of the galleries. There is much of interest in this show to the prospective buyer and to the student of the industry. It is a big industry and one which ought to command great attention from the business and social world.

RACING NOW IN THE BALANCE



ERHAPS some solution of the racing problem will come out of the meeting of the committee representing the various motoring organizations last week, but it seems to be the sentiment of some that racing ought to be continued despite the fact that a very large percentage of the club's members of the American Automobile Association said emphatically they were opposed to racing on ordinary tracks. It may be that the sentiment of a majority of the clubs forming the association will not carry sufficient weight with the association's officers to prevent a continuance of the dangerous sport, but this sentiment should be the cause of compelling the association to adopt such rules and regulations as will undoubtedly safeguard the lives of both the contestants and the spectators. No ordinary rule will suffice, and unless the rules—whatever they may be and whatever they may mean—are rigidly enforced at all times, they will naturally fail of their purpose. The track meets of the past have been loosely run, the interests of contestants have not been conserved, prizes have not been paid, and there have been too many Mr. Bill Pickenses and too much faking to make motor car racing successful. There has been opportunity for entirely too much criticism and there have been entirely too many accidents. It must be realized that to continue track racing and serve all interests fairly is no small task—it will require much thought and much consideration of all angles to finally settle upon something that will even approach a satisfactory point. So long as the interests most vitally affected are at work upon the matter they should be accorded support to the extent of waiting until they have had the opportunity to make report. But before a final decision has been made, whatever is suggested in the way of rules ought to be presented to the motoring world, in order that every possible criticism may be presented with a view of eliminating all that is not for the best for all concerned—the trade, the clubs, the contestants and the public. Permit the public and the press to have the new rule code and it will be the means of securing some ideas that have not come to even those who have spent years in the study of the motor car racing game. The matter has reached a point whereby any change in the rules should be made with such deliberation that, once adopted, the rules should be able to stand for several years to come, with occasional alterations demanded by changed conditions. If motor car racing is to continue it must be put on such a solid basis and in such form as to avoid the just criticism that has been thrown at it during the past few seasons, with the one just ended as the particularly cloudy one in its history. It cannot live under adverse criticism and it cannot live with its record of horrible and depressing accidents.



CHICAGO'S 600-mile reliability test is attracting the attention of so many makers in different parts of the country that it is rapidly assuming what its promoters desired to make it—a national affair. In 1903 the N. A. A. M. promoted an endurance contest from New York to Pittsburg; it was run late in the season and during the worst possible weather conditions. It was a difficult task for the drivers and officials, but it did more to boost the motor car than anything before or since. The west has needed some such tonic, although it is today a pretty liberal supporter of the factories. The run takes the cars to populous agricultural districts and through wealthy cities, natural fields for motor cars because in the sections through which the routes are laid there are many miles of good roads—good at any time of the year. If the test did nothing more than to show the people that out of Chicago there are hundreds of miles of touring roads it will have fulfilled one of its missions. But it is to show further what modern motor cars can do and it will demonstrate all this, not only to the hundreds of people who are in Chicago to attend the show at the Coliseum, but those who are in Chicago to attend the stock show. It should not be overlooked that these are the producers of the great west—these are the people who now have the money.

* * *

BROOKLANDS hung up over \$35,000 in prizes for motor car racing this—its first season—and while S. F. Edge won most races Hutton secured most money. But Edge was not out for money—he was in a big advertising campaign and to show the merits of the six-cylinder car, and he certainly completed his self-imposed task.

* * *

WHATEVER may be the merits of the contentions of Frank B. Stearns regarding the six-cylinder proposition, one thing is certain—that is, he has stirred up a sleeping lion, as is evidenced by the way the six-cylinder brigade has sprung to its guns at the sound of the first shot from Cleveland. Motor Age this week presents a defense of the six as prepared by the Winton company and has in addition another paper from the Franklin people on the same subject, which it is forced to hold over for a week because of lack of space, the Winton story first coming to hand. That Mr. Stearns should have succeeded so well in rousing his rivals only goes to show that the makers on both sides of the fence are fully awake.

* * *

THERE is a suspicion that California intends starting in to improve its roads, for it has asked information from the government about the methods of France in this work. Little by little the good roads microbe is being stirred into action, for many of the eastern states, some of those in the middle of the country and even those in the far west have shown signs of awakening. Heaven

knows it is time for some such action, something that will take away the reputation this country has of having the worst roads in any civilized community on the face of the earth. France built her roads as an aid to military operations and while this country may have no warlike spirit at this moment, nobody knows when some bomb may be exploded and when the federal government will need good roads. This is one of the reasons why the federal government should be a little more interested in its highways.

* * *

INDIANAPOLIS police have determined to call a halt on the motor cyclists who skim along regardless of the speed limits, it is said. Motor car owners will applaud this decision not because they are envious of the immunity from arrest apparently enjoyed by the riders of the two-wheelers, but because they believe the speed laws are meant for all. At the same time they feel there are other laws on the books in many cities which could be enforced with profit to all. For instance, Chicago has an ordinance which calls for all vehicles carrying lights at night. When the bill was passed it meant just what it said, but the police apparently take it to mean only motor cars. If some of those covered grocery wagons, for instance, displayed lighted warnings at night there would not have been the accident on Oakwood boulevard which nearly caused the death of an owner of a motor car who hit the wagon when it swung around a corner. There should be no class legislation.

* * *

SETTING the dates for the Florida beach meet for March certainly gets it away from the shows, but it is not possible that the management has gone a little too far on the other side and set the dates later than is necessary and at a time when spring trade—and spring duck shooting for the editor—is just opening, when tradesmen are exceedingly busy and when the resorters are returning home?

* * *

MOTORISTS apparently are imbibing common sense notions as regards contests, and as track racing fades into the background the promoters of events that are of educational value not only to designers but to owners of cars are being put on. In that category comes the cross-country run of the Automobile Club of Philadelphia for the Brazier challenge cup. Probably the best feature of this contest is that only members of the club can contest and that they must drive their own cars. This is as it should be, for the more interested become the owners in these contests the better it is for the sporting side of the game. Enthusiasm developed in this manner is of far greater value than the manufactured article as seen in a majority of contests. The trade, too, welcomes this innovation. If the dealers had their own way they would be only too willing to step aside and leave the field of competition clear to the owners of motor cars.

OPTIMISM THE PALACE KEYNOTE

Business Done Last Few Days of Independent Show Cheers Up Exhibitors—Attendance Almost Approaches Previous Year's—Big Luncheons Are Held

New York, Oct. 31—Good weather favored the 2 closing days of the Automobile Club of America show, which came to an end at the Grand Central palace tonight. It brought bigger crowds, livened up matters a lot, and altogether lent a cheerful atmosphere to the final days of the exhibition. With the money scare subsiding and stocks steady and inclined rather to rising than falling, pessimism and apprehension were forced to the background. Another cheering factor at the show was the mid-week arrival of scores of agents, who had put off their coming to a late enough day to admit of their taking in both shows.

Despite what is now very generally recognized as a too early date and a financial panic arriving and reaching its height during show week, results from an actual business standpoint were by no means altogether fruitless. There were plenty of dealers on hand to give new concerns looking to place agencies a fair chance to cover considerable territory. In the matter of selling the makers of low and medium-priced cars had the better of it, and few of them declared themselves as otherwise than satisfied. Even the exhibitors of the high-priced product, though not all boasting of sales, for the most part pronounced the show a paying proposition in that they secured good lists of interested investigators to work on after the show.

The management insists that the paid attendance was remarkably close to last year's figures under the unfavorable financial circumstances. There were fewer trade tickets distributed among customers than formerly, owing, perhaps, to their price having been doubled and the fact that they had to be paid for in advance.

The weight of opinion is against another October show. Many favor a return to December or January. Some suggest a September show to create fall business and others even a wait until March.

The idea of a dealers' show in addition to that of the makers is advanced with a date just preceding the opening of the spring selling season suggested. There is also some talk of the solution of the problem through an open air carnival at Morris park or the establishment of a motor week by the dealers, accompanied by a open house and a round of entertainments during the week.

Fairweather Club's Feed

New York, Oct. 31—That "it's always fair weather when good fellows flock together" was proved when 123 of them, embracing the members and guests of the

Fairweather Club, sat down to dinner at Reisenweber's last night to its first banquet. The club is an organization of folks who propose to hold a banquet once a month and pick a worthy man each time to place on a pedestal and toss bouquets to in evidence of their love and respect. John T. Cutting, of the Oldsmobile Co. of New York, the dean of the row, was chosen as the guest of honor last night on the occasion of his sixty-third birthday. Cutting received an ovation and responded in a speech full of sentiment, the formal part of which was devoted to an eloquent dissertation on the power of the press. Creswell McLaughlin, editor of the Schoolmaster, and Henry Duncan, of the local Acme agency, proved orators indeed. George Patten, an old friend of Cutting's; Tom Moore, free lance; A. G. Batchelder, of the A. A. A. directorate; W. M. Perett, of Detroit; and Peter J. Fogarty, the genial Irishman, were among the other speakers at the dinner.

A. M. C. M. A. Luncheon a Success

New York, Oct. 29—Close to 200 sat down to the second annual show luncheon given by the A. M. C. M. A. today at the Hotel Manhattan. They embraced leading members of the independent group, officials of the A. A. A. and A. C. A. and newspaper men. During the luncheon there was a telharmonic concert and the inevitable flashlight photograph. As a souvenir of the occasion a gold pin bearing the "Liberty at the Wheel" emblem of the association was given each guest. Job E. Hedges, counsel of the A. M. C. M. A., who is one of New York's crack after-dinner speakers, was at his best as toastmaster. Winthrop E. Scarritt spoke for the Automobile Club of America; General George Moore Smith for the club show committee; H. O. Smith for the association's show committee; and Tom Moore for the stock car race project. Benjamin Briscoe, president of the association, welcomed the guests. In concluding Mr. Briscoe paid a glowing tribute, as well he might, to the energy, enthusiasm and good sense of General Manager Reeves, which aroused a warm response. In fact the luncheon wound up with three rousing cheers for Reeves. Among those in attendance were:

S. A. Miles, William H. Hotchkiss, R. R. Parker, A. R. Pardington, C. E. Duryea, Jefferson deMont Thompson, James Joyce, C. G. Stoddard, Winthrop E. Scarritt, Colgate Hoyt, Robert Lee Morrell, R. E. Olds, Barney Everitt, P. S. Steenstrup, William H. Sweet, James Couzens, J. B. Bartholomew, Henry Ford, George Moore Smith, David J. Post, Benjamin Briscoe, Isaac B. Potter, H. O. Smith, H. S. Smith, William Mitchell Lewis, Job E. Hedges, Charles Lewis, W. H. VanDervoort, A. C. Newby, C. A. Mabey, Percy Owen, W. L. Gorton, H. T. Dunn, H. E. Raymond, Alfred

Reeves, Max Grabowsky, F. G. Goadby, Morris Grabowsky, G. A. Wahlgren, G. A. Blanchard, T. P. Myers, Mr. Moeller, Mr. Hale, C. S. Johnston, G. D. Wilcox, H. G. Edwards, C. S. Jameson, H. A. Palmer, George D. Wilson, G. D. Louderback, Jack Hiscok, F. I. Tane, Thomas Forbes, Jr., J. Willys, Frank Briscoe, Frederick A. Harris, C. J. Keegan, Neal Van Dervoort, M. W. Nicholson, Charles J. McMillan, Jr., A. E. Kennedy, R. Harry Croninger, George C. John, A. D. VanDyke, C. T. Vance, C. B. Hatfield, E. L. Ovington, F. F. J. Pell, J. M. Ellsworth, Thomas J. Fay, W. C. Marmon, H. C. Harmon, H. H. Rice, C. A. Matthews, F. L. Holmes, W. H. Blodgett, Joseph Goodman, F. W. Roche, R. G. Betts, Roy Drake, W. C. Allen, F. E. Moscovitz, J. S. Tracy, E. F. Graham, Mr. Duncan, Theo. B. Creamer, Dr. Clement Smith, C. E. Alexander, J. F. Billings, E. W. Gaus, P. L. Loomis, E. J. Moon, R. A. Whitney, C. G. Luthy, A. W. Bartholomew, L. P. Mooers, Stewart McDonald, C. W. Kelsey, John Kane Mills, Henry Rawie, A. L. Kull, J. M. O'Brien, J. S. Draper, N. Lazarnick, Henry A. Holman, William H. Harrison, W. Hildreth, David Beecroft, N. H. VanSicklen, F. J. Wagner, E. V. Stratton, F. Ed Spooner, Charles S. Wells, F. H. Elliott, Paul Gaeth, R. E. Hawkins, J. W. Gilson, C. V. Rogers, B. A. Cramm, S. C. Lindorfer, B. M. Stevenson, S. K. Tucker, Allen Miller, William Horner, James Laughlin, Jr., James Laughlin III, W. A. Woods, H. P. Burchell, A. S. LeVino, Mr. Walburg, W. F. Rempplis, Leon Myron Bradley, E. E. Schwartzkopf, W. E. Baldwin, S. W. Merrifew, C. H. Busby, C. A. Musselman, James Artman, W. G. Persson, C. D. Rainier, Paul Lineberger, H. N. Swetland, A. G. Batchelder, K. C. Pardee, A. B. Tucker, H. W. Mack, Horace DeLasser, S. H. Mora, W. N. Freeman, William Hurlburt, W. H. Burchell, H. B. Larzelere, F. R. Dreisbach, Robert A. Patterson, Harry P. English, F. A. Austin, W. M. McIntyre, W. H. Brinkerhoff, H. M. Woodrough, Howard G. Reynolds, Theo. P. Bailey, Mr. Robinson, H. Clemens, L. A. Hopkins, Gaston Pfaltz, Fred P. Brand, Harry A. Bubb, William I. Glasby, Nicholas Johnatgen, J. F. Klink, H. F. Donaldson, R. M. Owen, R. C. Reuschaw, R. B. McMullen, Frank Crane, W. S. Austin, E. G. Allen, C. B. Judd, A. R. Welch, L. H. Perlman, W. G. Morse, J. C. Kerrison, Duncan Curry, E. C. Ward, Lloyd Humphreys, A. N. Jervis, R. B. Johnston, F. A. McAllister, J. T. Sullivan, N. W. Beane, John C. Wetmore, Charles Barnes, E. P. Blake, W. H. Scott, Mr. Murphy, Walter Law, Jr., R. M. Bates, L. C. Boardman.

March Dates for Ormond

New York, Nov. 2—A meeting of the representatives of the Florida East Coast Automobile Association and others who have the tournament interests at heart has resulted in a decision to hold the sixth annual meet at Ormond this winter. Previous to the meeting at the New Plaza on Tuesday a preliminary meeting was held at 26 Broadway, New York, when Joseph R. Parrott, the general manager for the Flagler interests in Florida, supported the wishes of so many people who believed that the tournament should be given at a later date than formerly; so the date of the last week in March has been selected as that meets with the approval of President Foster and the board of directors of the Florida East Coast Automobile Association. A radical change is to be made in the program for the coming meet. The mile or 2-mile record sprints will be more or less subordinated to two big, long races, one for the racing cars that were built for the abandoned Vanderbilt cup race on Long Island and the other for strictly stock cars of 60-horsepower or less. The exact distances for these two races have not been as yet decided upon, but it is quite possible that the race for the specially constructed machines will be a similar distance to that of the long race. The race for the stock cars will possibly be 200 to 250 miles. A plan has been decided upon to protect the regular racing car from the so-called

freak production, and it is quite possible that the freak will have to go through a preliminary severe trial before being allowed to compete in anything under 5 miles. In other words, the management would possibly ask all drivers of all kinds of racing cars to engage in a 20-mile fast sprint at the minimum speed of, say, 45 seconds to the mile. This, it is thought, will eliminate any car constructed to go only 1 or 2 miles. If these cars survive the long sprint they will be eligible for the mile and 2-mile-a-minute races. There will be races for the regulation stock car and the races will be arranged according to price. In the long race the stock car will be of the stripped variety, and the driver will be allowed to take off a good deal of the superstructure, such as the tonneau, etc. Much discussion has been had in regard to the course. It was suggested that a half beach and half road course be laid out, but it is the firm conviction of the Florida East Coast people that such a plan is impossible, as it would not only be dangerous to use the almost impossible road but that it would not be safe to cross the two bridges at either end of the course. It has therefore been decided to construct land loops at either end, so that the turns can be made in both a fast and safe manner.

Miles Names Dollar Days

Chicago, Nov. 2—For the first time at Chicago the price of admission to the N. A. A. M. show will be raised on Wednesday and Thursday. The crowds attending the show for the last 4 years have been so dense it has been a difficult matter for investigators to get that attention to which they were entitled. The change in price of admission is designed to give these people breathing space and a chance to make an examination of the new models without overcrowding and to afford the attendants an opportunity to give them the necessary time for proper instruction. The admission fee on the other 5 days will be 50 cents, as heretofore. The show will open as usual at 2 p. m. on Saturday, November 30, and thereafter, Sunday excepted, at 10 a. m. It will close each evening at 10:30. One price of admission will entitle the visitor to admission to all of the buildings. It is not intended, however, to so crowd the commercial exhibit as to prevent proper investigation by persons genuinely interested. The management feels it is due to the exhibitors in this department to afford the interested investigating visitor every opportunity to secure all the information he desires. Visitors to the Coliseum who are sufficiently interested to make the request will be given tickets of admission to the commercial show without charge. Incidentally every effort is being made to secure the attendance of persons who are interested. Invitations containing season tickets have been mailed to the Illinois Manufacturers' Association.

SAYS RETAIN CONTROL

Special Committee Tells A. A. A. Not to Abandon Track Racing and Suggests Reforms

New York, Oct. 30—The question of further sanctions for racing on circular tracks or those originally intended for horse racing was discussed at A. A. A. headquarters today by the special committee on sanctions. There were present at the meeting W. H. Hotchkiss, president, and J. de Mont Thompson, racing board chairman, of the A. A. A.; S. A. Miles, of the N. A. A. M.; Benjamin Briscoe, of the A. M. C. M. A., and Percy Owen, of the Automobile Importers' Salon. Charles Clifton, of the A. L. A. M., was absent, as was also Ira M. Cobe, the Chicago member of the racing board. The following suggestions will be submitted to the several organizations represented on the committee, and action deferred until they have been considered and passed upon by all:

That the racing board of the American Automobile Association grant sanctions for speed contests on tracks not specially constructed for the purpose only on certain terms, viz.:

1—That the application be made through or by a club or organization which is a member of such association.

2—That such application be so made at least 6 weeks before the date set for the contest; provided, that in case a sanction has been granted for a contest on such track prior to the date of such application and after the investigation and under the conditions here outlined, such second or other application can be made within a shorter time before the date set for the contest.

3—That such application be accompanied by a photograph or photographs showing the turns of such track and the location of the grand-stand and public enclosures thereon, and also by an accurate drawing and specifications of the track, fences and structures adjacent.

4—That such application be also accompanied by a certificate of such club or organization that it has examined such track and the fences and buildings adjacent, and that, in its opinion, the contest or contests for which sanction is asked can be held thereon with reasonable safety to spectators and participants; which certificate must contain an agreement upon the part of such club or association that the public will be limited to certain portions of such buildings or grounds, specifying them, and excluded from all other portions thereof.

5—That such application include the nomination of a person or persons whom or from whom the racing board may appoint a referee, who, at such contests, shall be the official representative of such board and charged with the duty of compelling the observance of all stipulations specified in such application and sanction, as well as the rules of the racing board, in particular as to the competency of drivers and the mechanical condition of cars.

6—That sanctions on such applications be granted by the racing board only after an investigation of the track, fences, buildings and adjacent grounds, to be made by such board or a number of it or a competent engineer appointed by it for that purpose.

7—That all sanctions granted by the racing board specify: The number of cars which may take part in any heat, and the upward limit of the horsepower of such cars, the same to be fixed by a formula to be subsequently announced, as to which limit of horsepower and as to which formula the committee requests the advice of the various organizations represented.

8—That applications for sanctions be accompanied by a sufficient fee, to be fixed by the racing board, to cover all its expenses in connection with the examination of the track and its surroundings, as well as the reasonable compensation and expenses of any referee whom it may appoint as its representative.

As a part of the proceedings, a report was presented summarizing the vote of the clubs of the American Automobile Association, which have, thus far, taken action for or against the granting of future

sanctions on horse tracks as now constructed. This vote was as follows:

In favor of such sanctions unqualifiedly: Milwaukee Automobile Club, Motor Car Racing Association of Baltimore, Automobile Club of Kansas City.

In favor of such sanctions but with certain restrictions: Chicago Automobile Club, Quaker City Motor Club of Philadelphia, Bay State Automobile Association.

Against such sanctions: Automobile Club of Cincinnati, Massachusetts Automobile Club, Automobile Club of Pittsburgh, Rhode Island Automobile Club, Rochester Automobile Club, Cleveland Automobile Club, Albany Automobile Club, Wilkinsburg, Pa., Automobile Club, Brockton, Mass., Automobile Club, Automobile Club of Central Pennsylvania, Automobile Club of Auburn, N. Y., Grand Rapids, Mich., Automobile Club, Automobile Club of Schenectady, N. Y., Weld County, Colo., Automobile Club, Owatonna, Minn., Automobile Club, New Jersey Automobile and Motor Club, Lima, O., Automobile Club, Peoria, Ill., Automobile Club, Automobile Club of Buffalo, Wilkes-Barre Automobile Club, Automobile Club of Detroit, Springfield, O., Automobile Club, Cass County, Ind., Automobile Club, Janesville, Wis., Automobile Club, Long Island Automobile Club, Automobile Club of St. Louis, Worcester, Mass., Automobile Club.

Against such sanctions, in the opinion of the club secretaries—no official action yet taken: Oswego, N. Y., Automobile Club, Bloomington, Ill., Automobile Club, Springfield, Ill., Automobile Club.

No action either way: Automobile Club of Springfield, Mass., Automobile Club of Washington, D. C., Automobile Club of New Britain, Conn., Adirondack Automobile Club of Sandy Hill, N. Y., Halden, Mass., Automobile Club, North Jersey Automobile Club, Binghamton, N. Y., Automobile Club.

A majority of the clubs so voting, however, expressed the belief that racing should be continued on either specially constructed tracks, or, under restrictions and supervision which would make such racing safe to spectators and participants. The call for this vote was not sent out until October 7, hence many clubs have not yet taken official action.

JERSEY BILLS A CONTEST

New York, Nov. 3—A 24-hour endurance contest will be conducted by the New Jersey Automobile and Motor Club of Newark on November 15 and 16. The event is to be run over the public roads and violations of the legal speed limits are to be punished by disqualification. The competing cars are to be driven five times over a circuit from Newark to Montclair, Caldwell, Dover, Morristown, Somerville, Plainfield and Irvington back to Newark, the total distance being about 450 miles. All cars are to be grouped in one class and entrants must be members of the promoting organization.

PROGRESS MADE BY THE A. L. A. M. SINCE 1903

STATISTICS show the phenomenal strides made in the manufacture of motor cars and the rapid growth of an industry that 3 years ago was hardly out of swaddling clothes. In 1899 a few manufacturers had the courage of their ideas, and attempted in the face of adverse sentiment to make motor cars. At that time the capital invested was \$5,768,000, while the amount of business for that year was \$4,780,011. In 1904 the records show about \$35,000,000 employed to do \$26,645,064 worth of business. For the year 1907 the business done will be four times as much as 1904, or nearly 133 per cent increase in business each year. The estimates for this year show that directly and indirectly there is \$171,448,769 invested in the manufacture and sale of motor cars and accessories, while the gross amount of sales of cars alone will be over \$100,000,000. To produce this amount of business it requires 58,000 men directly interested in the manufacture or sale of motor cars and 29,500 men indirectly interested, making a total of 108,500 men directly and indirectly interested in the manufacture and sale of motor cars and accessories.

In 1903 the total output of American manufactured cars amounted to \$16,000,000. Of these \$13,000,000 were manufactured by members of the Association of Licensed Automobile Manufacturers. In 1904 \$26,500,000 were sold; \$21,000,000 by the licensees under the Selden patent. In 1905 the total was \$42,000,000, of which \$32,000,000 were licensed cars, and in 1906 \$59,000,000, with the members who manufactured under the Selden patent doing \$46,000,000 of the total amount.

The organization of the Association of Licensed Automobile Manufacturers is well known. The fundamental patent on the compression gas engine, which was granted to George B. Selden, was the basis for its organization. The leading manufacturers and importers of 1903, after a thorough investigation into the merits of the patent, became convinced of its validity and protected themselves, their dealers and the users of their product by securing a license. These licensees were the organizers of the association. From the start the association has had two objects—the protection of its members as regards their patent rights and the development of the industry.

From its organization a vigorous prosecution of infringements of its patent rights has been maintained. Some manufacturers were sued for infringement. How persistently the prosecution of the test case was maintained is told in the volume of evidence now on record, making it one of the most voluminous in patent litigation. The defense has, however, introduced nothing material that was not known to complainants before the bringing of the suits. Complainants' testimony

Harry T. Clinton Gives Some Interesting Statistics Concerning Growth of Motor Car Industry

was closed in January last and the case would have been ready for final argument this spring if defendant had not asked for additional time for taking surrebuttal testimony. Aside from this test case many other suits have been brought, mostly against users, for infringement of the patent, and many decrees have been entered holding that it is valid and that defendant had infringed the same. In some of these cases little testimony was heard; in others the contest continued for years. In a few cases defendant was allowed to settle by paying royalty and taking a license, and in some the court has awarded not only costs and damages to the owners of the patent but has granted perpetual injunctions, restraining defendants from further use of the cars.

That the many departments of the organization have been instrumental in the evolution of the motor cars to its present standardized condition is shown by the results each department has attained. In the mechanical branch, however, the greatest tangible evidence of this progress can be seen. It became apparent as far back as 1903 and 1904 that to reach a point of perfection in motor car construction some standard form of construction, standardized material and design would have to be reached and this could only be done by the mutual coöperation of the larger manufacturers. The mechanical branch was formed for this purpose, and consists of the chief engineers and factory superintendents of the thirty-two leading manufacturers who are members of the licensed association. The keynote of the mechanical branch is its experience meetings, interchange of ideas toward coöperative and intelligent standardization, which results in improved motor car design and production, the comfort and convenience of the public and the general imparting of sound information to the industry and its allied arts and sciences.

The accomplishments of the branch have been many, resulting in both direct and indirect benefits to the manufacturer and user. The A. L. A. M. screw standard, the adoption of a universal size for all nuts, bolts and screws used in the construction of motor cars has been one of the greatest standards used in any industrial individual enterprise; the adoption of standard spark plugs and universal formula for computing horsepower rating are of equal importance to the screw standard. In the former the many inconveniences caused by the varying sizes of spark plugs has been eliminated and the latter is an epoch-making innovation in the industry of motor car building.

Tires and rims have come in for their share of attention. Not so long since the tire and rim situation was in an almost chaotic state. Many sizes of tires were in the market—too many for economy or convenience to manufacturer or user. Intelligent interchange of ideas of tire makers and engineers of the branch resulted in a revision of sizes and decreased the number used from twenty-three to eleven, the latter being adequate for all demands. In the standardizing of steel tubing, rods, magnetos and many other component parts of a car the hall mark of progress is stamped on every car made by the engineers of the branch.

At Hartford a laboratory for exhaustive tests and scientific experiments in metals, oils, rubber and other materials is maintained by the branch, and the results are not only recognized by the manufacturers of the association but are recognized in all branches of engineering and by the various government scientific departments. It must be noted that while the engineering branch of the organization has been hard at work, the other branches have not been neglected.

Another feature and one of moment is the exhibition or show committee. To the first show committee of the association the credit of bringing order out of chaos in regard to motor car shows is due. Prior to that time very little system was used in the promotion of exhibitions. The exhibitors were required to arrange for their own decorations, signs, lighting and display of goods. No thought, care or taste was used, with the result far from artistic or even pleasing, it being a mere hodge podge and jumble of booth, cars and sensational advertising literature. The committee was the first, and is still the only body, to provide rules to prevent overcrowding of the show by other than the interested public and to exclude mere motor car experimenters from the exhibition. An innovation was the placing of all motor cars of the same nature and power in their appropriate places, making each exhibit complete in itself. It was the first to carry out its conviction that artistic and uniform decorations were the just due of the motor car. This could be better provided for by the management and would insure an artistic ensemble rather than barbarous individual decoration. The thoroughness of the show committee is shown in the details of its work. Not only does it provide the decorations, signs, lighting, furniture, telephones and transportation of the exhibitors' goods, but a postoffice and messenger service during the week of the show are established for the exclusive use of all exhibitors and their friends. The licensed show is the only one where the profits of the exhibition are rebated to the exhibitors pro rated according to space rental.

Another valuable department of the association is the traffic department. The growth of the industry has been phenomenal. From \$50,000,000 to \$100,000,000 worth of motor cars had to be transported from the factory to the consumer, thus creating a high class of freight. The railroads were unprepared and freight cars for this class of freight were scarce. The traffic department, knowing the requirements necessary, pointed out to the railroads the advisability of specially constructed cars. At first only a few were put in service, but at present there are over 5,000 freight cars for the exclusive transportation of motor cars on the rails.—H. T. Clinton.

YULE A POPE RECEIVER

Hartford, Conn., Nov. 1—Judge Ralph Wheeler, of the superior court of the county of Hartford, today appointed George A. Yule, of the Badger Brass Co., of Kenosha, Wis., permanent co-receiver of the Pope Mfg. Co., of Hartford, in the state of Connecticut. This appointment is significant inasmuch as Mr. Yule is now the permanent receiver of the company in New Jersey, the home state of the corporation. The inventory of assets was accepted and an allowance on account of \$2,500 for the temporary receiver was ordered paid by Judge Wheeler; likewise John R. Hills and Frederick C. Billings are to be reimbursed to the amount of \$1,000 each for services as appraisers. Separation of the proceeds of the Massachusetts and Maryland receivables was also ordered. Frank E. Hipple, of New York, representing Henry L. Saltonstall, of New York, and certain other holders of some 1,500 shares of the capital stock of the corporation, which had at one time been the American Bicycle Co., had no opposition to offer against Mr. Yule, but he did desire the appointment deferred for 48 hours until he could consult with his clients, who knew nothing about Mr. Yule. Mr. Hipple severely criticized the internal workings of the company, characterizing its reports as cryptograms that no one could understand. He read from a report that the corporation had purchased more than 1,000 shares of its preferred stock and Mr. Hipple asked who the favored stockholder was that could get cash for the 1,000 shares of stock.

ELEVEN NAMED SO FAR

Nominations Pouring in For the Chicago Show Reliability—Big Field is Expected

Chicago, Nov. 4—Present indications point to the 600-mile 3 days' Chicago show reliability run of the Chicago Motor club being the most important motoring event of the year—maybe not in point of size, but in importance, strenuousness and advertising value, coming as it does as a curtain-raiser to the national show in the Coliseum. At the present writing there are eleven entries actually in hand and at least sixteen others that have been definitely promised. This makes it look as if from thirty-five to forty cars would take part in the test of November 26, 27 and 28, entries to which close at midnight November 21.

In hand now are nominations of the following cars: Royal Tourist, two Pierce-Arrow sixes, two Mathesons, two Haynes, two Dragons and a Rambler and Wayne. Included as certainities are the Pennsylvania, Overland, Marion, American, Berliet, Reo, two Premiers, two Corbins, Stoddard-Dayton, Buick, Studebaker, Stevens-Duryea, Oldsmobile and Locomobile, with the Great Smith, Mason, Franklin, Tourist, Autocar, Lozier, Holsman, Maxwell, Jackson, Columbia, Thomas and Pierce-Racine as strong possibilities.

The prize list, it is estimated, will run close to \$2,000 in value, the first one being a \$1,000 bronze statue donated by Samuel A. Miles, general manager of the National Association of Automobile Manufacturers. Those who have seen the figure cast in plaster declare it to be one of the finest motoring trophies yet designed. It is to be 33 inches in height exclusive of the ebony base, and it will not be completed until the day before the show

opens. Besides the Miles trophy there is for a second prize a \$400 sterling silver ale set given by the B. F. Goodrich Co. Third prize will be a \$300 sterling silver loving cup put up by the New Southern Hotel Co., which houses the Chicago Motor Club. In addition there is a silver loving cup given by E. A. McElligott, a member of the motor club, who intends it to go to the winning driver. In case of a tie it will be run off. Other prizes will be secured, it being the intention to offer one for the observers. In addition minor prizes will be put up for the drivers of the cars if the present plans of the committee are carried out and there are sufficient entries to warrant it.

The actual work of laying out the routes started this morning, when the Rambler people sent out their crew to go over the roads between Chicago and South Bend, which will be the first day's journey. This will take a couple of days. S. E. Comstock is in charge.

PACKARD WINS BRAZIER CUP

Philadelphia, Pa., Nov. 2—Threatening weather, which developed into a steady downpour of rain before the end of the contest, spoiled the fifth annual cross-country legal-speed-limit run of the Automobile Club of Philadelphia for the Brazier cup. Eight cars started, and all finished the 84-mile run before 3 o'clock in the afternoon. The rules of the contest required close adherence to the time limits set by the state in the open country and by the various towns, boroughs and villages on the route. The fastest possible time in which the route could be legally covered had been determined by several trips of members of the tours and runs committee over the route. E. L. Miller, in a Packard, was adjudged the winner, having but eight points' penalty chalked up against him. Several of the contestants were penalized for arriving at the finish ahead of time. Following is the order in which the judges placed the Brazier cup cars at the finish: Packard, E. L. Miller, 8 points; Winton, W. A. Philander, 10½; Pennsylvania, Yarnall Abbott, 14; Apperson Jackrabbit, C. J. Swain, 28; Stoddard-Dayton, Herbert Morris, 29; Ford, Allen Wood, 36; Packard, G. B. Fletcher, 42; Winton, H. P. Bradley, 50.



CHICAGO SHOW RELIABILITY RUN PRIZES—GOODRICH ALE SET, MILES TROPHY, McELLIOTT CUP AND NEW SOUTHERN CUP.

IN DEFENSE OF THE SIX-CYLINDER TYPE

Cleveland, O.—Editor Motor Age—We have noted with much interest the article in a late issue of Motor Age by Frank B. Stearns on the subject of six-cylinder motors, and inasmuch as he had been permitted to attack the class of product to which this company is committed, we assume that you will allow us the courtesy of space for our reply. Except for the fact that Mr. Stearns has constituted himself a spokesman for the four-cylinder crowd we should not have dignified his illogical statements by giving an answer to them. We feel, however, that many a reader of Motor Age may take Mr. Stearns' remarks seriously, hence the necessity of telling the truth. Our statement is as follows:

A maker of four-cylinder cars, who is also making a few sixes, has appeared in the daily and trade press with the declaration that sixes are inferior to fours; by which admission he confesses that he is now making inferior cars—in other words, that he is retrograding. However, he explains his fall from grace by stating that he was "forced into it," and since the force must have come from without, we can only conclude that it represented competition and public demand. He does not successfully show why the public should demand inferior cars and still be willing to pay more for them than it pays for fours. He rightly states that one claim in favor of the six is that it runs smoother and easier than the four, adding that the torque is said to be "much more continuous." Continuous is not a comparative term. Either a thing is continuous or it is not continuous; there is no half-way continuity. "Continuous" describes that which is absolutely without pause or break. Torque means driving pressure exerted on crankshaft and driving shaft. The only element in a motor car that exerts driving pressure is the motor, and whether the driving pressure is continuous or not depends wholly upon the number of pistons. Note the operation of a single-cylinder motor, because each individual cylinder of a four-cycle motor car engine performs the same operations, whether there be one, four or six cylinders in the motor unit. In the single cylinder there are four piston strokes to each complete cycle, each cycle requiring two complete revolutions of the crankshaft, as follows:

1—First half-revolution of crankshaft. Gas drawn into the cylinder. Termed the suction stroke.

2—Second half-revolution of the crank-

4 CYL. MOTOR	CRANK SHAFT REVOLUTIONS			
	1/2	1	1 1/2	2
CYL* 1		EXH.	SUCT.	COMP.
CYL* 2	COMP.		EXH.	SUCT.
CYL* 3	SUCT.	COMP.		EXH.
CYL* 4	EXH.	SUCT.	COMP.	

Winton Motor Carriage Co. Answers F. B. Stearns' Arguments Against that Design

shaft. Gas compression in the cylinder. Termed the compression stroke.

3—Third half-revolution of the crankshaft. Combustion and expansion of gas in the cylinder. Termed the power stroke.

4—Fourth half-revolution of the crankshaft. Burned gas expelled from the cylinder. Termed the exhaust stroke.

Note also the demonstrated and accepted mechanical fact that the power of the power stroke does not continue throughout the entire stroke. Hence, in a one-cylinder motor power is exerted less than one-fourth the time. In the four-cylinder motor, the four pistons are so timed in relation to the crankshaft revolution that each piston is at all times one stroke behind its predecessor. So while one cylinder is developing power, another is compressing, another drawing in a charge and another exhausting. Thus power strokes

6 CYL. MOTOR	CRANK SHAFT REVOLUTIONS			
	1/2	1	1 1/2	2
CYL* 1		EXH.	SUCT.	COMP.
CYL* 2	OMP.		EXH.	SUCT. C
CYL* 3	T. COMP.		EXH.	SUC
CYL* 4	SUCT.	COMP.		EXH
CYL* 5	XH.	SUCT.	COMP.	
CYL* 6		EXH.	SUCT.	COMP.

in the various cylinders follow one another. Power impulses, however, are not continuous. They are separated by intervals of no power at the end of each power stroke, for, as already stated, power is exerted during only part of the power stroke. On this point there is no difference of opinion among mechanical engineers.

Due to this condition, it follows that the power stream of the four is not continuous, but intermittent, and that the torque of the four is never continuous but always intermittent, and this condition is not changed no matter how fast the four motor may turn over.

Notwithstanding this truth, the four-cylinder spokesman declares that:

"It is probably not out of place to state that we claim to obtain in our four-cylinder motor the gradual and even application of torque that is talked so much about in the six. This we accomplish by means of a superior carbureter, which we have developed after 10 years of constant experimenting to get a perfect gas-making apparatus."

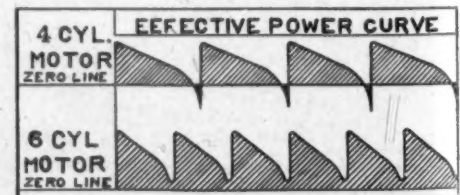
Any remarks relative to carbureters in relation to torque are as irrelevant as a claim of perpetual motion. The best carbureter in the world cannot cause a piston

to be driven farther than the length of its stroke. "Argument" cannot disregard established mechanical laws. In the six-cylinder, as in the four, two crankshaft revolutions complete the cycle and during this period each of the six pistons has performed its four strokes. The pistons of the six are timed in relation to the crankshaft revolution so that each cylinder is not one complete stroke behind its predecessor, as in the four, but is only two-thirds of a stroke behind its predecessor. Thus in the six, the power of one power stroke is not spent before the succeeding power stroke takes hold. Consequently, the power stream of the six is never intermittent but always continuous, and continuous means "absolutely without pause or break." Recall also that torque means driving pressure exerted on crankshaft and driving shaft. Torque cannot be continuous if power is not continuous. Continuous torque in the four is a physical impossibility. In the six torque is ever present and cannot be prevented, no matter how slowly the motor may turn over. And continuous torque means smoother running and easier riding than is possible with intermittent torque; also it means longer life to car and lower fuel consumption. The four-cylinder spokesman says:

"The basic argument in favor of the six-cylinder is the continuous torque—but let us carefully dissect this argument for a moment. A six-cylinder motor geared, say two to one, delivers twelve impulses to the rear axle for every revolution of the wheels. Acting on precisely the same principle, a single-cylinder motor geared twelve to one will also deliver twelve impulses to the axle for every revolution, and the forward movement of the car is just as smooth as though six cylinders were employed."

A six-cylinder motor geared two to one delivers six, not twelve impulses, in the period stated, and a single-cylinder geared twelve to one delivers six, not twelve impulses. This mistake on the spokesman's part is one of mathematics, an exact science: does it increase his authority on points that may be somewhat more speculative?

The comparison of a single-cylinder with a six can hardly be serious, however, for with both motors giving the same number of revolutions per minute, the single would drag along 1 mile while the six would cover 6 miles. And in doing that work the piston of the single-cylinder would travel six times as far as any one piston of the six, hence being subjected to six times



the wear and tear. And beyond all that, the torque of the single-cylinder can no more approach the continuity of six-cylinder torque than can two parallel lines meet. For continuous torque is obtained only from power strokes that overlap, as they do in the six.

"It has been claimed," declares the spokesman, "that six cylinders of given size will develop 50 per cent more power than four cylinders of equal dimensions, all other things being equal. But is this really the case? I think not. Years of experimenting have shown us that with all other things equal the addition of two more cylinders does not produce 50 per cent more power. In fact, a much smaller percentage than that was all that could be noticed after over a year of expert testing."

This is the prize avowal. One horsepower is that volume of energy capable of raising 550 pounds through 1 foot of space in 1 second of time. If one cylinder of given size will develop 10 horsepower—that is, be able to raise 5,500 pounds through 1 foot of space in 1 second of time—no influence on earth can prevent two exactly similar cylinders from developing twice that power. And on the same reasoning, if four of these cylinders develop 40 horsepower, it would be a freak of mechanics if two additional cylinders exactly similar—working under identical conditions—did not develop 50 per cent more power. This is not a matter of individual opinion or of expert testing; it is the working out of mechanical laws. Perhaps the four-cylinder spokesman contends that of four exactly similar cylinders, total rating 40 horsepower, one cylinder would develop 15 horsepower, another 13, another 7 and another 5. If so, which of the four is the 15 horsepower cylinder, and why? Again:

"The principal difficulties with the six-cylinder, which no one can deny, are that it requires 50 per cent more mechanical parts, 50 per cent more ignition apparatus, 50 per cent more gas apparatus, has 50 per cent more valves to grind, has 50 per cent more weight, and requires 50 per cent more radiating surface than a four-cylinder motor of equal power, and consequently requires 50 per cent more care and 50 per cent more repair bills."

This statement is loose. For instance, mechanics know that radiating surface increases as the square, whereas cylinder volume—horsepower—increases as the cube. The statement of radiating surface is therefore inaccurate and tends to discredit the other statements. "Fifty per cent more ignition apparatus" might be taken to mean that if four cylinders require one magneto, six would require one and a half magnetos, and we assure an innocent and unsuspecting public that this fear has no foundation in fact. Read this:

"It is somewhat questionable whether the double complication resulting from the

added two cylinders is warranted by the improvement in regularity of running and freedom from vibration secured."

This quotation is not from the four-cylinder spokesman's remarks. It is the serious talk of an American motor car authority, Albert L. Clough. One might think he were arguing against six cylinders, but he isn't. His talk was delivered 2 years ago and he was arguing against the four and in favor of the two-cylinder, which today has as few friends to defend its cause as the four will have 1 year hence. The quotation is introduced merely to show that the old stock arguments, which no longer hold good against the four, are now being tried in vain against the six.

"Fifty per cent more care and 50 per cent more repair bills," says the spokesman.

Let us see. Does the four require 100 per cent more care than the two? Are its repair expenses 100 per cent greater? If not, then the relative argument against the six also fails.

The four-cylinder spokesman laments the length of the six bonnet and wheelbase. On the Winton Six-Teen-Six the bonnet is 7 inches longer and the wheelbase is but 8 inches longer than on the four-cylinder model M.

"The carburetion difficulties increase because there are two cylinders taking in gas at the same time, and great care must be used to distribute this evenly to all cylinders."

The answer is in the carburetor manifold; this can be properly made so that the difficulty is overcome. Ought to be an easy task for the maker who can produce torque by means of a carburetor.

On the Winton Six-Teen-Six the carburetor manifold is unique and efficient, so efficient in fact that no carburetion difficulty has been encountered. And in six-cylinder construction generally, since suction through the carburetor is continuous, carburetion reaches a perfection unknown where suction is intermittent, as in four-cylinder motors.

"Think," says the four-cylinder spokesman, "of an ordinary chauffeur attempting to grind in twelve valves and to time a double system of ignition, or to adjust the valve timing!"

Mercy! The man who can grind in one valve can grind in a thousand with no greater mental exertion per valve. The man who can time one system of ignition, can time a dozen. And the man who can time one valve can time a limitless number of them, because an increased number of cylinders and valves does not change the relation of a single valve to its particular piston.

"Throughout the world," he declares,

EDITOR'S NOTE—A similar paper has been received from the H. H. Franklin Mfg. Co., but lack of space compels Motor Age to postpone the publication of the article until its next issue.

"it is almost invariably the case that racing machines are four cylinders."

The most wonderful racing performance the world has ever seen—1,581 miles in 24 hours—was done by a six-cylinder car. And that performance hardly bespeaks carburetion or ignition difficulties, either.

"We ourselves build six-cylinder cars," he adds, "to give the speed and power that a few drivers demand."

Excessive speed and power are the least important advantage of the six. The more important, due to overlapped power strokes and continuous torque, is that the six requires actually less developed power to do driving work. Take two cars of equal rated total horse power, and the six motor will drive its car at a slower motor speed than the four. And, accordingly, the six always has in reserve over normal work a supply of power not possible in the four. The six has a wider range of speed on high gear than has the four, requires less gear changing, is sweeter running, has less wear and tear, gets the more power out of gasoline and is more silent than the four. These, not excessive speed and power, are six strong points.

"Why, then," concludes the four-cylinder spokesman, "is it necessary to use six cylinders if the torque of the four is practically constant, the supply of gas being even and steady at all speeds?"

It wouldn't be. The fact is that these are the identical points on which all fours, irrespective of make, fall down, due not to individual construction but to the shortcomings of the four-cycle principle. And these faults are overcome in the six-cylinder.—Winton Motor Carriage Co.

RECEIVER FOR SHOEMAKER

Elkhart, Ind., Nov. 30—Pressure brought to bear by creditors has forced the Shoemaker Automobile Co. into the hands of a receiver, the receivership having been assumed voluntarily by the company. The concern recently moved to Elkhart from Freeport, Ill., Elkhart citizens having subscribed for \$30,000 in stock to get the factory. Wilson Roose, formerly secretary of the Elkhart Business Men's Association, was named receiver by Judge Van Fleet of the superior court. The application was made by Charles E. Clark, one of the officers of the company. It is claimed the Shoemaker company's total indebtedness is \$22,000. The State bank at Freeport holds a claim of \$6,000, while the remaining \$16,000 indebtedness is distributed among several supply companies, from which the company purchased its materials. It is believed by holding the company intact it will pull through. After a committee of Elkhart men had been at Freeport to examine the company's books the report was made that the concern was in good condition financially. None of the \$30,000 subscription has as yet been turned over to the company.

RACING YEAR IS OVER

Final Meet of Season Held at Brooklands Track in England—Principal Winners

London, Oct. 20—The last of the scheduled race meetings for 1907 at Brooklands has been run and if there is anything more at the big track this fall it will be in the nature of special events, several of which have been tentatively arranged. It is not beyond the range of possibilities that royalty will visit the track. S. F. Edge, while despairing of getting on the match with the Darracq through Huntley Walker, is bending every effort to bring it about in the hopes of running it when Emperor William of Germany is here. The kaiser has said he would visit Brooklands with the intention of securing ideas that may help him in the construction of his own track in the fatherland. If he does it is more than probable King Edward will accompany him, which will be the latter's first visit to Brooklands.

Another thing planned for Brooklands is a 2,000-mile trial by Clifford Earp in a six-cylinder Thames. It is not Earp's plan to make it anything more than a reliability trial under the auspices of the Royal Automobile Club. He aims to average 60 miles an hour and has no intention of going after Edge's 24-hour record.

Before another season comes around there will be several innovations introduced at the big track. One of them was attempted at the last meeting when an effort was made to use a balloon to start the contestants in a handicap. Everyone knows how difficult the task is of getting off a big field scattered around the track, and it was thought the balloon would solve the problem. The scheme failed, though, and instead rockets were substituted, the latter working very well. Another innovation is the new pulling-up arrangement. A broad black mark is painted on the track after the finish tape. Cars finishing a race keep inside the black line, hugging the poles, while the racers who have another lap to go keep up on the bank out of the way.

The final averages for the season show that F. R. Fry has been the most successful owner, the Napier the best among the cars and F. Newton, a Napier man, the driver to score the most points. Fry entered five times and was in the money each time—three firsts, one second and a third. Edge had twenty-seven entries. He won twelve, was second three times and third four times. J. E. Hutton was third with three firsts, and a second out of thirteen chances. Newton drove in eight races, winning six times and being second another time. H. C. Tryon in nine starts won six times and was second once. D. Resta won three out of seven. A. Huntley Walker started fifteen times and won twice. He was second five times.

Eight makes of cars figure in the percentage table, at the top of which is the Napier with thirty-one entries, twelve firsts, four seconds and four thirds. The Mercedes started twenty-two times, was first eight times, second four and third twice. The Daimler started five times, won once and was second once. Out of seven starts the Metallurgique won once, was second once and third once. The Thornycroft won once, and was third twice in eight starts. The Darracq was in the money fourteen out of twenty-six times with three firsts, five seconds and six thirds. The de Dietrich tried ten times, and won one first, one second and a third. The Minerva went to the post in eighteen races, winning once, being second once and third twice.

Roughly, \$35,000 was divided in prizes among eleven owners, Hutton getting the lion's share with \$11,910. Edge landed \$11,910 and the third best showing was made by Fry, who captured \$4,100.

MAKES ROAD RECORD

Springfield, Mass., Oct. 30—The Knox Automobile Co. has established a new 24-hour record for road work with two of its 1908 models. The cars used were model L and model T, the former covering 705 miles and the latter car 688¼ miles. There was only one puncture, that of a tire on model H car, but the engine ran continuously and there was a delay of only 7½ minutes. The course was over what is known as the triangle, beginning at the corner of Benton street and Wilbraham road, out to Sixteen Acres, where a turn was made into Parker street, thence into Boston road, to Benton street, turning then to the starting point. The course has four sharp turns, necessitating slowing down to 12 miles an hour, and there are several steep grades. An added feature of interest was the trying out of the Fisk rims, one set of tires coming through without replacement of the casing and without being punctured.

SMALL CARS CONTEST

Paris, Oct. 23—Sixty-three cars started yesterday in the coupe de voiturettes, designed for two-seaters. The majority of the machines have single-cylinder engines of 8 or 9 horsepower. There are a few exceptions possessing two and four cylinders, but very few. The roads were in a dreadful condition owing to the heavy rain, but in spite of this fact several of the competitors succeeded in attaining an average speed of over 60 kilometers per hour. Thirty kilometers per hour is all that is demanded by the organizers, and in future all machines exceeding an average of 40 kilometers per hour will be disqualified. The contest will continue until Saturday, four turns of the circuit being accomplished each day, instead of seven as originally intended. Those left in the running will on Saturday compete in a final speed contest over the circuit.

TRAINED MEN ON JOB

France's Road Superiority Due to Highways Being Under Government Supervision

Washington, D. C., Nov. 1—There are in France 23,656 miles of national routes, which cost \$303,975,000 to build. There are also 316,898 miles of local highways built at a total cost of \$308,800,000, of which the state furnished \$81,060,000, and the interested localities \$227,740,000. This information has been secured by the highway commission of Los Angeles, Cal., which sent to France for information likely to be useful in constructing a system of roads in California, recognizing the value of France's experience in the nationalizing of highways, which have been of immense value to the entire population of that country. The information has also been sent to Washington and is in part as follows:

It is generally recognized that the best and most complete road system in the world is to be found in France, where it stands as an enduring monument to the administrative greatness of Napoleon. French roads are good, not because of any superiority of raw materials, as the same materials exist everywhere; they are not good because of any special talent for road building, as the formula was furnished by an Englishman, and some roads just as fine may be seen in parts of the United States. The real superiority of the French highway system is attributable to the fact that it is under the constant intelligent supervision of trained men, who discover within the organization opportunities for advancement and professional distinction which no mere county administration can offer.

The proof of this assertion may be found in France itself. If that country has a wonderful network of great arteries of general communication called national routes, there also is in every department or county a system of local roads connecting the small towns and villages, built and maintained by the local governments, and very inferior to the national routes. The construction and maintenance of the local roads are affected by the same unfortunate influences which ordinarily attach to county effort in America, but in less noticeable degree. The French type of road is therefore the broad and smooth national route, upon which in rolling country one good draft horse is expected to be able to travel 18 miles per day, hauling a load of 3,306 pounds. Public opinion requires that the local highways be kept in sufficiently good condition not to interfere with the horse efficiency here indicated.

The basis of the French highway administrative system is the school of bridges and roads, one of the finest technical schools in the world and, like all

other French educational systems of importance, a state affair. It is intended to educate the engineers who afterward take positions in the highway administrative system. Ordinary students are accepted also and are graduated with the diploma of civil engineer.

A national route in France, like a railroad, must be first declared necessary by a special law. At the present time comparatively few new national routes are being added to a system that already is old and complete. A standard roadway in France is much simpler than is commonly supposed. Experience has demonstrated that profound foundations and other expensive construction are far less important than a careful drainage system, and in providing this, French methods particularly excel.

The chief concern in France is that all preliminary and necessary operations shall be thoroughly performed. Every dangerous turn is protected by a stone parapet, and stone posts are planted 1 kilometer apart, with ten smaller stone markers at equal distances between the kilometer stones. At each cross road there are signposts, always in order, and nowadays, thanks to the Touring Club of France, there are indicators to remind the traveler of dangerous curves, rapid descents, paved drains, and the like. Every grade crossing is protected by a gate with a watchman in charge night and day.

The advent of the motor car has placed increased tasks upon the French road makers. No method has yet been discovered of preventing the file-like action of the rubber tires upon the road surface. Coal-tar baths do some good, especially in keeping down the dust, or rather in preventing its formation.

GAILLON CLIMB RESULTS

Paris, Oct. 20—One of France's hill-climbing classics was contested yesterday at Gaillon over muddy roads. Despite this a Napier, driven by Newton, went up in 26 seconds, an 84-mile an hour pace. The Regini-Dixi military transport made the climb in 1 minute 10 seconds. A Crespelle one-cylinder did 2 minutes 41 seconds, a two-cylinder Souriau 2 minutes 3 seconds, while in the four-cylinder division a Martin-Lethimonnier did 1 minute 51 second in class A, a Prunel 1 minute 9 seconds in class B, a Regina-Dixi 59 seconds in class C, a Mass 53 seconds in class D, a Regina-Dixi 47 seconds in class E, a Mors 48 seconds in class F, and a Martin-Lethimonnier 56 seconds in class G. A six-cylinder Quentin did 1 minute 10 seconds. In the star event a Martin-Lethimonnier did 57 seconds in the class under criterium rules, a Benz 49 seconds under emperor's cup rules, a Bayard 48 seconds under Targa Florio rules, a Darracq 59 seconds under sportive commission rules, while Newton drove the Napier in class E faster than did Gore the Mercedes and Jateau the Rebour.

LIKE THE MOTOR TRUCK

Indianapolis Business Showing Interest in Commercial Propo-sition—Some Sales Made

Indianapolis, Ind., Oct. 28—The feature of the 1907 trade has been the remarkable, and it might be said, unexpected demand for motor trucks and delivery wagons. As a result a large number of dealers have been caught napping, and the few who were far-sighted enough to close for business car agencies have been reaping the harvest. There is little doubt but that next season is to see a still larger demand. While the tide has been long in turning, those who are in close touch with the situation believe that motors will displace horse-drawn service. It is evident that the demand is to be principally for delivery wagons and light trucks. There are no hills of importance in the city, which would give heavy trucks any great advantage on short hauls.

Merchants, however, seem anxious to make quicker and more frequent deliveries, which they have found impossible without a large and costly horse-drawn service. The demand for cars of this type is also spreading to the smaller Indiana cities, where concerns operating two or three delivery wagons can do their entire delivery work with one gasoline or electric vehicle and at about one-third the expense. Some heavy trucks are also finding their way into Hoosier towns, but the number is not large.

A glance at recent sales to local business houses within the last 3 or 4 months has shown how great and varied has been the demand for delivery wagons and trucks. At least thirty-three have been placed in service, while there also has been a large demand for runabouts for traveling and city salesmen. Recent additions to local trucks and delivery wagons have been: Adams Express Co., nineteen electric trucks; City Express Parcel Delivery Co., six gasoline trucks; Lily & Stalnaker, hardware dealers, electric delivery wagon; Glossbrenner-Dodge & Co., dairy and poultry dealers, gasoline wagon; N. A. Moore Grocery Co. and Columbia Grocery Co., one gasoline delivery wagon each; New York Store, gasoline furniture truck; L. G. Deschler, wholesale cigars, one gasoline delivery wagon; Pierson Cigar Co., wholesale and retail, one light gasoline delivery wagon, and Knight & Jillson, wholesale hardware and plumbers' supplies, one gasoline truck. The city council has included \$1,500 in the 1908 budget for the purchase of a gasoline patrol wagon for the police department. It is rumored that the New York Store will buy some additional light gasoline delivery wagons and that Kingan & Co., meat packers, will displace some of their hay motors with gasoline trucks.

Such activity in commercial circles is

regarded as most promising by those Hoosier dealers, who see great possibilities in the business rigs in the near future. The streets of Indianapolis are particularly adapted to the use of trucks, and this no doubt has been an important factor in whipping the business interests into line. One of the chief drawbacks to the use of motor trucks in most large cities has been the deplorable condition of the streets used for business purposes. Where there are fine boulevards for pleasure cars the trucks are obliged to take to the side streets, and so it is no wonder it is hard to convince people in such cities as to the practicability of the motor truck.

FOR FREE BRIDGES

Hartford, Conn., Nov. 1—There is little doubt now that the bridges over the Connecticut river will be free. Attorney General Marcus H. Holcombe has a suit on hand returnable before the November session of the superior court and the writ that figures in the transaction quotes the doings of the last legislature on the making free of all bridges now spanning the Connecticut. The Middletown bridge is a modern structure and the people of that vicinity long have fought for a free thoroughfare. The state asks for the appointment of three disinterested persons who will assess the value of the bridge to the corporation owning it upon the state. The bridges will be paid for by the state and maintained by the counties in which they are located. In this connection it might be well to mention the clever ruse of President Mellen of the Consolidated railroad which recently completed at the mouth of the Connecticut river on the sound a stone structure with a draw. The government demanded that as soon as the new structure was completed the old one should be removed. The new bridge was considerably higher than the old and the latter permitted but one train to pass at a time. To make a long story short, President Mellen very cleverly offered the bridge to the state for a good round sum with the stipulation that his company be permitted to track it for a contemplated trolley system. Motorists throughout the state immediately raised a howl, for at best it would cost the state an immense amount of money to put the thing in shape and furthermore the available roadway was less than 14 feet wide, which would not permit of a motor and trolley car passing one another should they meet in the middle of the bridge. The motoring faction finally accomplished the defeat of the railroad magnate.

MOTOR BOATS BARRED

Buffalo, N. Y., Nov. 2—It has been announced that on account of the fact that the space to be used at the next motor car show in Buffalo will be limited it has been necessary to make the ruling that only motor cars and accessories will be permitted. At this show the ban will be placed on motor boats and marine engines.



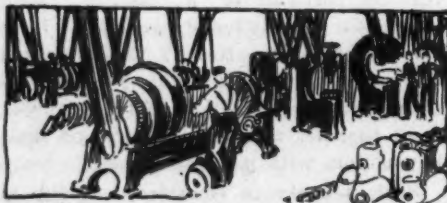
MOTOR CAR SHOP KINKS



ADJUSTING BEARINGS

The adjustment of plain bearings is a subject upon which a great deal has been said and much written, but about which the average man still possesses little practical knowledge. This seems to be due to too much generalization in most explanations of the subject, specific details being left to the reader to puzzle out by experience. There is no reason, however, why any one with a reasonable degree of mechanical intelligence should not be able, by the exercise of some care and patience, to refit a bearing of the ordinary babbitted type, for instance, with as much success as the experienced shop man. The two points most misunderstood, because least explained, are, first, that it unavoidably takes considerable time and trouble to secure a satisfactory result, and, second, that it is not generally practicable to obtain even apparently perfect surfaces, a near approximation serving every purpose. As the bearing is received from the foundry, or as it is found in the mechanism after a period of wear, it consists of two similar semi-cylindrical halves, cast of babbitt, white bronze or other soft alloy and hollowed out to fit closely over the shaft, which they are prevented from binding by the separating action of thin sheet-brass strips, called shims, interposed between their edges. Quality in a bearing of this character is chiefly a matter of good metal and close fitting over the entire surfaces in contact. It is not found possible to produce such fitting merely by accurate casting, nor even by the reaming that is sometimes resorted to. For the final finish scraping must be employed. This process can be illustrated as well by describing the refitting of a worn bearing as by the fitting of a new bearing, since in both cases substantially the same things must be done. The usual symptom of a worn bearing is a characteristic knock or pound of the journal that revolves in it. In this case it will be found that the fit is loose and contact, as shown by the worn areas, incomplete. Simple removal of a few shims, at most, will tighten the bearing, but will not remedy the incomplete contact. The shims will be of various thickness, if the bearing is well designed, so that by selecting the right ones for removal any desired adjustment can be secured. In other cases, for fine fitting, it may be necessary to file slightly the surfaces of one or two shims. When possible a point should be made of removing equal amounts of shimming from both sides of the bearing, though some bearings give very good service in which it is not possible to adjust both sides, the bearing cap being hinged. When the adjustment is such that the bearing clamps up tight—a trifle too tight for free movement—it

should be opened up, the journal painted evenly with an exceedingly thin mixture of Prussian blue in water, and the whole clamped together again—after the color has dried. By now rotating the shaft three or four turns, the Prussian blue will wipe off on the high spots in the bearing. Opening up again, these colored patches must be delicately scraped down with a sharp-cornered steel tool made for the purpose, the painting done over, and bearing and journal clamped up as before, to again test the work. Over and over this must be done, regardless of the onerous work it involves, especially with constructions that are complicated to assemble, if a good bearing is to be the result. The work can be considered right, not when the blue rubs off evenly all over—an almost impossible condition to obtain—but when the high spots are very small and very numerous, and evenly distributed over the entire bearing surface. Even an experienced mechanic, trained in the work, can rarely bring a single bearing into thoroughly good condition with less than 3 or 4 hours' steady labor, so it is easy to understand that patience is a virtue of the first order in work of this character, and that any attempt to save the time legitimately called for will result in the sort of poor job that is, unfortunately, too often a feature even in new cars. Of course a bearing not properly spotted in, as the shop slang has it, will run, and, for the time being, run as smoothly as the other kind, but its life—to the time when refitting is again necessary—will be very much shorter, because there is a smaller area to withstand the amount of wear that will cause looseness. In an emergency, and if more thorough attention is to be given subsequently, it always is permissible to tighten a bearing without scraping it, care being taken not to get it so tight that it will heat in running. In this connection a trick worth knowing is that a few sharp raps with a hammer on the cap and the end of a bearing will often loosen it up when it seems to have been adjusted too tightly. It always is a good plan after an engine bearing is got in shape to run it for a short time by belt or otherwise than by its own power, so that overheating can be guarded against when, for instance, a car is taken out on the road. Many a motor that has had bearings refitted has been ruined because of this oversight.



] CAKE OF THE TIMER

The timer of the average car is an easy thing to neglect, even by motorists otherwise most conscientious in the care of their cars. While different makes widely differ in their capacity to withstand abuse and infrequent lubrication, it is a fact that most timers give the best service only when they receive daily attention. A commutator really operates under materially heavier duty than a casual consideration of it indicates. Run at a pretty good speed, which, however, may widely vary from one minute to another, its contacting elements are at a sufficient distance from the center of rotation to travel a really great distance. On top of this add the fact that certain parts—the insulated surfaces—cannot be of material that resists wear any too well, and the possibilities of trouble begin to appear. Moreover, serious derangement can be caused by what would be little more than trifling in any other machinery—the presence of a minute quantity of most finely divided metal in the lubricant. In fact, just as soon as wear has progressed enough to establish this condition—long before any apparent wear exists—short circuiting occurs and the whole action of the motor is hopelessly deranged until the timer is thoroughly cleaned and relubricated. The best way to clean a timer or commutator is to wash it out with gasoline, after all old lubricant is drawn from it with an oil gun. The gasoline should be squirted in with considerable force by the gun, and then drawn off, so that the operation may be repeated with clean gasoline. Several applications of this process will produce a perfectly clean condition, whereupon, after all traces of the gasoline have been permitted to evaporate, fresh lubricant can be supplied and the timer will work perfectly. Many motorists prefer to use kerosene in place of the gasoline, but it does not clean so well, although if any is left it will help the lubricant instead of injuring it. Gasoline, however, cannot do the latter if all trace of it is permitted to evaporate. The best lubricant is a light clean oil, or vaseline. A timer that is worn so that there is a "step" at each dividing line between insulation and a contact cannot work right until it is refaced. This is best done by exceedingly careful turning—with very light cuts—in a lathe, but in the hands of an expert careful filing down of the contacts will serve the same purpose. The pressure desirable between the contacting members depends much upon the design of the commutator and the nature of the materials used, but in general it must be just great enough to maintain positive contact under all conditions.



LEGAL LIGHTS AND SIDE LIGHTS



MERRY MOTOR WAR ON

Justice Harry F. Taylor, whose pursuit of West Chester and Philadelphia motorists led to the latter having him hauled into court for his failure as road inspector to keep the highways in his district free of loose stones, was fined \$50 and costs by Justice Russell, who sat in the case. Later Justice Taylor came back by causing the arrest of Joseph W. Belt, of West Chester, who took several photographs of Taylor's stony roads and—so the justice asserts—“placed certain stones maliciously, willfully and unlawfully on the public highways of East Goshen township, to the common nuisance of the traveling public.” The justice insinuates that his enemies dumped a lot of loose stones in the road and then photographed them, submitting a print, along with a bushel of stones, as evidence of his neglect of duty. The motorists have also brought suit for illegal arrest against G. Washington Lewis, on the ground that he was not a legally appointed constable; meantime, however, Lewis has secured a license for motor trapping. Justice Taylor now has his baiters instructed to stop all motor car drivers and insist upon their showing their licenses, and trouble daily results from this action. One wealthy owner has moved from the section in disgust and others threaten to do so. The war still goes on, and the end is not yet.

AFTER BETTER ROAD SERVICE

W. U. Hensel, of Lancaster, Pa., representing the Lancaster Automobile Club and other associations in his section which are fighting for better roads, has served notice on the road supervisors and constables of the Lancaster county townships that they are expected to enforce the laws regarding sign boards and loose stones on the highways. He says in his notice: “At each quarter session court it is made the duty of the constables to report specifically as to the erection of hand-boards. Heretofore this duty has been slighted, neglected or ignored. Investigation has shown that there is not a township in Lancaster county in which the provisions of the act of 1836 are fully complied with; and yet the constables, term after term, have deliberately reported to the contrary. This is therefore to notify and advise you that the foregoing acts of assembly are in fore; and that they will hereafter be enforced, viz.: ‘In any township in Lancaster county in which during the month of October the supervisors do not remove and take away the loose stones they will be prosecuted according to the terms of the act of 1901. Inspectors will be sent over the roads on and after November 2 with instructions to report

every case of default; and in all such cases actions will be instituted for the recovery of the fine or penalty. Supervisors will be expected to erect at all intersections of public roads, hand-boards legibly inscribed as provided by the act of 1836. On or after October 20, any supervisor failing to comply with this duty will be given ten days or more notice; and on or after November 2, suits will be brought to recover the penalty for neglect of duty. At the November court of quarter sessions any constable who fails to report any neglect of the above duties by any supervisors, or to report sign-boards erected when they are not erected, will have his return challenged and excepted to; objections will be filed against the allowance to him, of any costs or mileage, and due measures will be taken against him for a false return and neglect of duty.’ I deem it my duty to give you this timely notice, as the committee having these matters in charge instruct and advise me that no exceptions will be made or permitted in any case.”

CHANGED HIS MIND

A queer suit has just been started in the courts of Washington county, Pennsylvania. D. H. Swart, doing business under the name of the Washington Automobile Co., has sued James A. Jordan for \$1,175 with interest from August 31, 1907. The plaintiff alleges that he sold Jordan a car for \$1,175 and agreed to teach him how to run it. The defendant took his first lesson in September, 1906, in his new car at his own request. After being out a while with his instructor the defendant took charge of the car. For a while he had no trouble, then suddenly he lost his presence of mind and dashed into a fence, damaging the car considerably. The machine was fixed up at the plant of the plaintiff. On September 4 the defendant took his second lesson and made good. At his request the car was placed in the garage of the plaintiff. The next day the defendant, it is said, refused to take any more lessons or to pay for the car, having decided that he did not want to become a motorist.

MOTORISTS WIN APPEALS

Massachusetts motorists have scored two victories where municipal authorities tried to put a ban on cars. In Dedham the selectmen named a number of places where the speed was restricted to 10 miles an hour. It was over thoroughfares where cars passed on the way to Providence and back. So the matter was taken to the highway commission on protest. After several hearings the commissioners decided that the rate should apply only to three streets and for short stretches.

Taunton had passed an order that in the city within 2 miles of City square the rate of speed should be 8 miles an hour. Beyond that area and within the limits of the city no car should go above 12 was the gist of the ordinance. As Taunton is a much traveled city and its limits extend well out on the highways where there are few houses the motorists made a protest to the commission. After going over the matter and looking at the conditions in Taunton the commission vetoed the order, making it inoperative. This places the rate of speed back to the state law again.

CITY BLAMED FOR ACCIDENT

Damage suits approximating \$50,000 will be filed against the city of Colorado Springs as a result of the accident of September 17 in which three men were killed and six others injured, one of them probably being maimed for life. The criticism directed against Albert W. Marksheffel, the driver, following the accident, has given way to serious investigation on the part of two leading law firms, and in their judgment the city and Mr. Marksheffel were responsible for the accident. The widow of Will H. Ralston has started the movement by filing suit against the city demanding \$5,000 for the death of her husband, setting up the claim that the city was negligent in not properly protecting the irrigating flume into which the car skidded, thus throwing out her husband with the rest of the occupants. Britton L. Graves, one of the most severely injured, and who was unconscious for a week after, has sued for \$15,000. The outcome of these suits will decide the action to be taken by others interested. Marksheffel was held responsible for the accident by the coroner's jury, and is charged with involuntary manslaughter.

COMMON SENSE RULING

The superior court in Boston gave the police officials a jolt when eighteen cases were brought up for trial on appeal on charges of overspeeding. The men had been caught in a trap on Tremont street where the grade was down hill and the pavement of asphalt so that cars occasionally coasted along at a little above the regulation speed. The first case called was that of Ralph Coburn of the Maxwell company, who had been held up at 11:30 o'clock at night when there was no traffic, and who was not going any faster than two cabs that were the only vehicles on the thoroughfare. The jury quickly returned a verdict of not guilty. A second case got similar treatment from another jury and District Attorney Moran then went into court and taking all the other cases not pressed every one of them. The trap has been abolished.



AMONG THE MAKERS AND DEALERS



Rice Going to Seattle—R. P. Rice, assistant manager of the Chicago branch of the Ford Motor Co., has been appointed manager of the new branch the company will open in Seattle, Wash.

Will Sell Grout Plant—The receivers for the Grout Brothers Automobile Co. give notice that they have filed a petition for leave to sell the plant at a private sale to William L. Grout, of Greenfield, Mass.

Making Big Plans—The Brown-Lipe Gear Co., of Syracuse, N. Y., will manufacture gears enough to equip 25,000 to 30,000 cars next year. In its new building this company has 70,000 square feet of floor space. An addition doubling the capacity of the case hardening plant has just been installed.

Motor Maker in Trouble—A petition in involuntary bankruptcy has been filed at Utica, N. Y., against the Elbridge Motor and Tool Co. which has been manufacturing motors. The liabilities are \$75,000. The petition of creditors are the R. C. McClure Co., R. B. Sweet and Jesse S. Law. There is a possibility that the company will be reorganized and moved to Syracuse, it is said.

Receiver Appointed—A petition in bankruptcy has been filed against the Diezeman Shock Absorber Co., manufacturer of shock absorbers, 420 East One Hundred and Sixth street, New York, by Charles L. Kohler, \$808; Theodore Cohn, \$450, and W. A. Feuchs, \$100, all on notes. It was alleged that the company is insolvent, made preferential payments of \$2,000 and transferred merchandise and accounts of \$2,000. Judge Holt appointed W. H. Smith receiver, bond \$4,000, on application of Walter T. Kohn, who stated that the liabilities are over \$32,000, and assets \$7,500, principally in the factory at 1311-1313 Hudson street, Hoboken, and a car.

The company was incorporated under Maine laws in October, 1905, with a capital stock of \$200,000.

Sackett With A. K.—Louis J. Sackett has been made sales manager of the Allen-Kingston Motor Car Co. of New York. He is a veteran of the industry, having been in the trade since its inception. His recent positions have been traveling representative for the Peerless Motor Car Co. and for Smith & Mabley and is well known in the trade.

Clever at Rebuilding—J. W. Collins, a California repair man, sends Motor Age a photograph which shows an '04 Autocar which he rebuilt at night after working hours last summer. He tried the car out on a 400-mile trip to San Diego and other coast points and declares there is much improvement in speed, power and the riding. He says it rides easy on very rough roads and handles like a big car. This is the fifth car he has rebuilt.

Deere-Clark Plant Appraised—The appraisal of the property of the bankrupt Deere-Clark Motor Car Co. shows the total assets to be \$60,465.30. The total liabilities of the company are now estimated at more than \$100,000. The main items are: Real estate, building, etc., \$23,583; personal, \$31,261.61; accounts receivable, \$5,620. The item personal property includes machinery unfinished and finished but unmarketed product. The future of the plant and business lies practically in the hands of interests in which C. H. Pope and A. E. Montgomery are the dominating factors. It is said these interests hold more than 80 per cent of the \$100,000 or more claims against the defunct concern, and it is probable that they will buy the factory if the motion to sell, which is soon to be made, receives favorable action. Pope and Montgomery 2 weeks ago made a propo-

sition to the creditors. They offered to buy all claims at 35 cents on the dollar in case no attorney had been employed, and at 40 cents on the dollar in case the expense of attorney's services had been incurred.

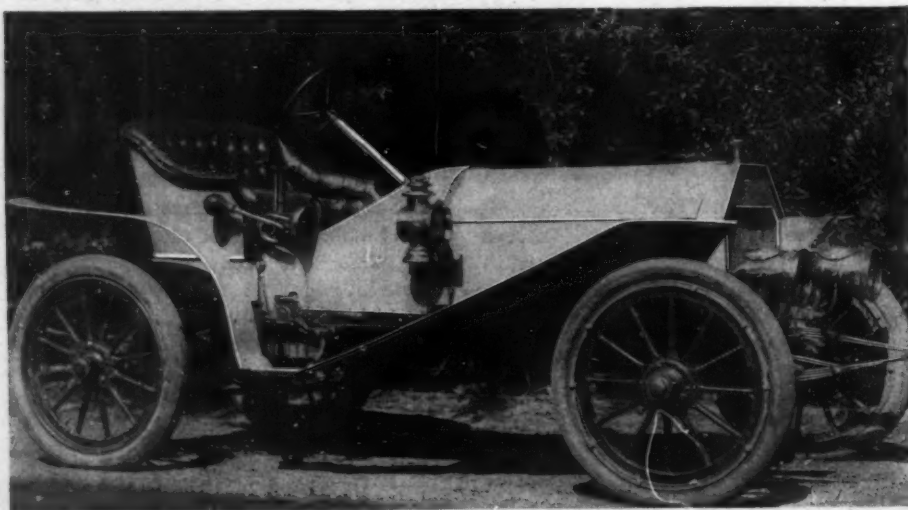
Uses Stewart Sirens—The Stewart & Clark Mfg. Co. calls attention to the fact that the British military airship, Nulli Secundus, uses its long distance sirens and that one of them also was used by the Wellman north pole expedition.

Directors Chosen—The Bellefontaine Automobile Co., of Bellefontaine, O., recently held a meeting at which the following directors were chosen: E. R. Albaugh, W. R. Niven, Nevin U. Smith, W. W. Osborn, Dr. J. H. Wilson, C. E. Yoder, John P. Aikin, S. L. Horn, Joseph JoHantgen, George C. Leidigh and W. E. Aiken.

Company Reorganized—The retirement of R. J. Irvin from the Capital Auto Co., Indianapolis, has necessitated a reorganization in the company. F. W. Eisle has been elected president to succeed Mr. Irvin. Other members of the company will be W. A. Seibert and H. H. Emeis, the three having purchased the block of stock held by Irvin. The company's 1908 plans are unsettled and it has not been decided so far what cars will be handled next season by the concern.

After Open Shop—Manufacturers of Kenosha, Wis., led by Thomas B. Jeffery, president of Thomas B. Jeffery & Co., Rambler manufacturers, and W. L. Yule, secretary of the Badger Brass Mfg. Co., maker of lamps and parts, have formed an association. The purpose is to make every plant in Kenosha an open shop. Mr. Jeffery is president of the association, and Mr. Yule is secretary. The association will operate a free employment bureau for labor, and aims to protect its members in the right of freedom of contract in the employment of labor against restriction or limitation of output and against strikes and boycotts.

Offers a Business Chance—R. A. Creek, of 2151 Central avenue, Indianapolis, states that he has an unusually good proposition to offer some reliable manufacturer of motor cars or parts which he considers an opportunity to increase capital and decrease operating expenses in a district where labor questions are unthought of. The plant is already established and ready for operation, being fully equipped from power plant to office. It has a capacity for 350 men. Mr. Creek was connected with the industrial move at Newcastle, Ind., last year, which succeeded in securing the Maxwell-Briscoe company plant.



AUTOCAR OF 1904 MODEL, REBUILT BY CALIFORNIAN



FROM THE FOUR WINDS



Spanish Club Changes Name—The Automovil Club de Guipuzcoa of North Spain, whose late president was the Count of Torro-Muzquiz, has been renamed, and in future, by permission of the king or Spain, will be known as the Real Club Automovilista de Guipuzcoa. Its new president is the Duke of Sotomayer.

C. A. C. Ticket—The Chicago Automobile Club's ticket for the annual election November 14 is as follows: President, Ira M. Cobe; first vice-president, F. H. Pietsch; second vice-president, T. J. Hyman; secretary, N. H. Van Sicklen; treasurer, C. E. Gregory; directors, John Farson, W. W. Shaw, A. J. Banta, F. D. Countess and T. J. Koehler.

Oiling City Streets—Joseph L. Hogue, much to the delight of Indianapolis drivers, is making an experiment in oiling Capitol avenue from Fall Creek to Thirty-fourth street. Mr. Hogue is city street commissioner and is in favor of street oiling if it can be done at a moderate expense and in a satisfactory manner. When the Capitol avenue boulevard was completed last spring, persons living north of Fall Creek objected to their portion of the street being changed, so it was left as a macadamized pavement. Hogue proposes to oil all macadamized streets in the city next year, if the present experiment proves satisfactory.

Will Race in Florida—Cedrina will drive the Fiat Cyclone at Ormond this winter. The Fiat Cyclone is a midget racer of short wheelbase, and of weight that makes it eligible for the middleweight class which has a limit of 1,440 pounds. The new Fiat racer weighs only 1,420 pounds. Its power plant is a duplicate of the motor used on the Fiat car which won the kaiserpreis in Germany last summer. The motor is of the four-cylinder vertical type, cast in pairs, employing a Simms-Bosch low tension magneto, and make-and-break ignition. Overhead or rocker valves are used, there is an extra oil tank with a hand lever pump on the left-hand side of the car, the driver in this case sitting on the left, because the car is intended for track work and straightaway road work, and road racing which follows the American practice of turning to the left. There is no room and no seat on the car for a mechanic, the driver therefore, having to attend to all the various details while the car is running. From the dash to the rear axle, the body of the car has no floor or bottom, the driver resting his feet on the pedals. Two speeds and a reverse only are fitted in the selective gearcase, the gears being shifted by means of a small lever on the right-hand side of the driver; a powerful brake is fitted

on the rear wheels, operated by a lever on the left-hand side, the differential brake being pedal-operated. Control of the car is by hand control of the spark on the steering wheel and a foot throttle.

Tarring Roads—The city of Winona, Minn., across the river from Eau Claire, Wis., is doing experimental road work. Twenty barrels of tar have been purchased, and this will be spread over a macadam base, prepared on Lafayette street, between Fourth and Broadway. On this there will be placed fine gravel. A steam roller will be used to pack this mixture solid. So far as known nothing of this kind has ever been done in the northwest.

Thomas Wants Boulevards—At a recent meeting of the legislative good-roads committee of Buffalo E. R. Thomas, motor car manufacturer, and County Engineer Diehl of Buffalo made important suggestions. Mr. Thomas advocated a state system of boulevards connecting all the chief places of the state. Mr. Diehl thought it would be wise if the state were divided into districts of four or five counties each, with a good roads engineer in charge of each district.

Rules for Rubbernecks—The increasing number of sight-seeing motor cars in Washington, D. C., has led the authorities of that city to consider the adoption of a police regulation to govern their movements. The proposed regulation provides that no sight-seeing car shall be permitted to stop at any place other than a public hack stand, for longer than 15 minutes at a time, nor thereafter until the expiration of 1 hour. The further provisions that no proprietor of a sight-seeing motor car shall have within the city more than two offices, and that only one car shall be permitted to stand in front of each office are also being considered. The

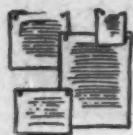
sight-seeing car business has developed to a great extent in Washington, no fewer than ten different companies now operating in that city. Some of them have three and four cars in operation. The influx of new companies this year was due to the great crowds visiting Washington on their way to and from the Jamestown exposition in the south.

Turkey Opens Its Doors—Referring to the announcement that motor cars, which up to the present time have been debarred from entering Turkey, are now authorized to do so with certain restrictions, a commercial report points out that though good roads in the country are non-existent the inhabitants, who delight in novelties, will probably purchase cars, which will have to be made strong on account of the inequalities of the road surface. It appears that there are a few provinces in Turkey which are more fortunate in their roads where, doubtless, a larger opening will be found. American manufacturers might do well to investigate this new field, which is considered a most promising one by the consuls.

King Interested in Show—King Edward and the Prince of Wales have both consented to extend their patronage to the sixth international motor exhibition of the Society of Motor Manufacturers and Traders at Olympia. At the dinner of the society on November 8 the lord mayor of London will be present. This will be Sir William Trelear's last official act, as his mayoralty ceases at midnight. One of his first appearances as lord mayor was to open the exhibition last November. Arrangements were made for a press view of the show on Sunday, November 10. A scheme of decoration of the show was also arranged on a more extensive scale than any previous year, and the affair probably will excel previous exhibitions.



FIAT CYCLONE WHICH CEDRINO WILL DRIVE AT ORMOND



BRIEF BUSINESS ANNOUNCEMENTS



Los Angeles, Cal.—M. Dilly has been appointed western agent for the Autocar.

Sioux City, Ia.—Wyriek & Bennett have been appointed local agents for the Corbin.

Grand Rapids, Wis.—F. L. Halliday & Son have opened a garage and repair shop. They will also build motor boats.

Milwaukee, Wis.—Richard Gove, who is the local manager of the Auto Exchange, is looking for a suitable location for a new garage.

Dover, Del.—The Phoenix Auto Works Co. of Wilmington has been incorporated with a capital stock of \$25,000, and will manufacture motor cars.

Bordenton, N. J.—D. L. Swift has opened a garage at Greenwood avenue and Chambers street, where he will act as agent for the Moline, Autocar, Franklin and Stearns.

Pomona, Cal.—F. H. Osler is contemplating the erection of a new brick building on Third street. When it is completed he will remove his motor car and pump business from its present location, and will build a new brick block on the old site.

Bay City, Mich.—The auction sale of the Smalley Motor Works was held last week. The highest bid for the property was \$26,000, though the plant was inventoried at \$110,000. The mortgage on the plant amounted to \$20,000. As the sale has not yet been confirmed, it is likely another will be ordered.

Houston, Tex.—The Empire State Motor Co., which was recently incorporated, has opened its garage at 614 Milan street. The concern has the agency for the American, and also will carry a full line of supplies and accessories. E. A. Sontag, late of the Frederick Sontag Co. of Boston, is to be in charge of the garage.

Flint, Mich.—The Michigan Castings Co. has been incorporated and will engage in the manufacture of metal castings. J. W. Thomson, of Detroit, has been elected president; Frank Bromley, also of Detroit, vice-president and treasurer, and A. H. Goss, of Flint, secretary. A plant is now in course of erection at Flint, and the company expects to be in business by the first of the year.

Newcastle, Ind.—A new motor company is in process of organization. According to the present plan, F. A. Freeze is to be the president, A. E. Bulson vice-president, and C. E. Pigeon secretary and treasurer. Plans are being drawn for the erection of a garage 60 by 80 feet. According to reports, the Fort Wayne Motor Car Co. is to be merged with the new concern, and George Aldrich, president of

the old company, is to be made manager of the new one.

Canton, O.—The Havana Auto and Cab Co. has been incorporated with a capital stock of \$5,000.

Tonawanda, N. Y.—A rumor has been current that negotiations have nearly been closed for the location of a big motor car factory in this city.

Batavia, N. Y.—Edward J. Dellinger is erecting a new building on W. Main street. The lower floor has been rented by Kilts & Kennedy, and will be fitted up as a garage.

New York—Albert H. Funke, a dealer in guns and motor car supplies, with a store at 83 Chambers street, has been discharged from bankruptcy with liabilities amounting to \$102,338.

Salt Lake City, N. Y.—The Wagon and Machine Co. has taken over the garage which is being fitted up at the old Payne & Lyne headquarters on State street. The premises will be devoted exclusively to the motor car branch of the company's business.

Brooklyn, N. Y.—An involuntary petition in bankruptcy has been filed against the Plaza Automobile Co. by A. Adelbert. The company, through its president, H. A. Sands, admits its inability to meet its obligations, and D. A. Lewis has been appointed receiver.

Newark, N. J.—The Brick Church Automobile and Supply Co. has been appointed agent in East Orange for the Rambler. It has taken over the garage at Harrison street and Railroad place, which formerly was occupied by Snyder & Co., and in addition to acting as agent for the Rambler, the company will carry



National City, Cal.—Western Motor Co.; capital stock, \$200,000; to manufacture engines and motor cars. Incorporators, W. H. and C. E. Hunt and C. L. Brimhall.

Springfield, Ill.—Rockford Automobile and Engine Co.; capital stock, \$50,000; to manufacture motor car engines and machinery. Incorporators, A. E. Pareles and J. P. Waters.

New York—Coomber Tire and Rubber Co.; capital stock, \$25,000; to manufacture tires, rubber packing, etc.

Ithaca, N. Y.—Thomas & Grant; capital stock \$25,000; to manufacture motor car and marine engines. Incorporators: C. C. Thomas, Frank W. Grant.

Rochester, N. Y.—Hollis-Rand Co.; capital stock \$5,000; to manufacture motor cars, etc.

New York—The Pardee Motor Co.; capital stock \$10,000; to manufacture cars, motors, vehicles, boats, etc.

a full line of supplies. An electric charging plant has also been installed.

Groton, Conn.—The Holmes Motor Co. has increased its capital stock from \$30,000 to \$80,000.

Trenton, N. J.—The Advance Engine and Mfg. Co. of Jersey City has been incorporated with a capital stock of \$25,000 and will manufacture motors.

New York—The H. J. Koehler Co., which has the agency for the Buick, has taken a long lease of the building at northwest corner of Broadway and Fifty-seventh.

Boston, Mass.—Charles Haigh has been added to the staff of the Stranahan & Eldridge Co., the agent for the Buick. Mr. Haigh was formerly the agent here for the Northern and Pullman.

Baltimore, Md.—William B. Boyd has entered the rental business in Baltimore. He has a garage at 404 Orchard street. LeCompte & Diffenderffer also have opened a garage at 217 North Calvert street.

New York—Irving Washburn has been appointed temporary receiver for the Winchester Speedometer Co., a New York corporation with a factory at Pelham. The liabilities amount to \$4,997, and the assets to \$1,712.

Brooklyn, N. Y.—The A. G. Southworth Co., which was recently incorporated, has filed a certificate with the secretary of state, announcing that half its capital stock, amounting to \$100,000, has been paid in. The certificate was signed by A. G. Southworth and F. H. Leonard.

Philadelphia, Pa.—The Philadelphia Automobile Accessories Co., which started in business about a year ago, has decided to extend its business this season by the addition of a top department. G. B. Demarest, of New York, has been secured as manager of this line of the business.

Rochester, N. Y.—The F. A. Brownell Motor Co. has been organized with a capital of \$400,000. The company will manufacture motor cars and similar articles. The directors are: F. A. Brownell, W. H. Dunn, William Deininger, George C. Whipple, Robert C. Kershner, Thomas J. Swanton, Burton H. Davy and Clarence E. Shuster.

New Haven, Conn.—The Connecticut Automobile Works Co. has leased the factory formerly occupied by the National Folding Box Co. on Congress avenue, and expects to start the manufacture of cars within the next 10 days. The building is fully equipped with suitable machinery, so there will be no alterations necessary. The concern will manufacture touring cars, runabouts and trucks.